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# THE INTERIOR DECORATION OF SCHOOLS

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Our graded school requires of its pupils a classroom attendance of eight thousand hours. This is a heavy tribute to levy upon the period of childhood, and it may well purchase other things for the pupil than an acquisition merely of those weapons of traffic dear to the utilitarian's heart—the so-called rudiments. It is the present purpose to discuss some of those silent influences which, without interference with the traditional purposes of the school, make for a richer childhood and a better community.

The first of these concerns the color effects of the classroom. When a competent architect plans a schoolhouse, he presumes of course that, given due time for drying out, the plaster walls will be appropriately tinted or papered, and in such tones as will give a harmonious color unity to the whole room. It is noticeable, however, that in the average American schoolhouse this ideal is seldom consummated. We rush our furnishings in, and the painters and plasterers have hardly packed up their tools before the classes are settled in an established school routine. And as for those glaring white walls, we "first endure, then pity, then embrace," finally forgetting that the plan was ever otherwise.

There are reasons, however, beyond a mere aesthetic preference, why the schoolroom walls should not be left white. It is the common testimony of physicians that the glaring whitewash intensifies nervous

afflictions and injures the eyes. Many a mother diagnoses her girl's nervous headache as a case of overstudy, when it is in reality a product of five hours' exposure to the harsh, blinding glare of the schoolroom walls. And many a boy is condemned as a wickedly disposed nuisance, when he merely exhibits a nervous irritation which a proper color scheme will abate. A well-known Massachusetts physician, Dr. Myles Standish, of Boston, says:

> I have often seen children immediately and permanently recover from a persistent recurring diseased condition of the eyes when removed from a schoolroom with white walls, and sent elsewhere to school or kept at home, where the walls are tinted. The principal color of the walls should be of an even tone, so that the amount of light reflected will be the same from all parts of the surface, as waving or clouded effects are very trying to sensitive eyes. Any color may be placed in its proper position with regard to its safety for schoolroom walls by remembering the general rule with regard to the sensitiveness of the eye to the colors of the spectrum, which is, that the nearer the color is to the red end of the spectrum, the more irritating it is to the eyes; and the nearer the color is to the blue end of the spectrum, the easier it is to the eyes, with the single exception that the extreme violet rays also are irritating.
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> From this it will be seen that red and all its derivatives should be rigidly excluded, and orange also is nearly as bad, while yellow should never be taken by preference. Greens and blues are absolutely safe colors, and it is not at all necessary that the colors should be pronounced; the depth of the color should be made dependent upon the amount of light coming in at the windows, and upon its quality, as, for instance, whether the windows have a northern or southern exposure, whether the sun's rays can come directly into the room when the sun sinks low in the heavens in the middle of a winter afternoon, and other surrounding circumstances of each individual room.
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> The color of the ceiling of a schoolroom is fully as important as the color of the walls, particularly when there is any amount of reflected light.
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> All I have said with regard to the color of the walls is doubly true when applied to the window shades, and this fact should always be taken into consideration in furnishing and decorating a schoolroom.

Medical science is constantly finding new and positive evidence of the pathological effects of color. And it rests with any of us to make simple experiments which will show conclusively the influence of color upon the emotions. Look through a blue glass, and we see a sad, unhopeful prospect, in the midst of which only the utmost exertion of will-power can sustain a cheerful mood. Look through a red glass, and the reverse feeling is aroused. The outlook is one of

exaggerated sunshine, which stimulates the imagination, induces a sanguine mood, and suggests action. The blue-glass craze of the seventies was an incident which foreshadowed the wide employment of color as a remedial agent.

We are thus in possession of a more or less definite knowledge of the pathology of color. We know that red is stimulating, irritating, unrestful. We know that blue is quieting, but also depressing. Since the pupil of the elementary school spends eight thousand hours in actual attendance in the classroom, it is of the highest importance to give him a color environment which will not, on the one hand, be a source of depression and melancholy, nor, on the other, an agent of excessive nervous stimulation.

We have such a color in green of the quieter sort. There is a whole gamut of greens, running from light apple down through the stone-greens, or "dried pea," to the deep, rich olives. This series is perfectly adapted to the requirements of interior tinting, either for home or for school. The distinction is often made between a north and south room, reddish buffs and terra-cottas being recommended for the former. This distinction is not vital, however, and we always approach the danger line as we move toward the red end of the spectrum. One of the most delightful school buildings it has been my good fortune to visit is tinted throughout, north and south rooms alike, in low stone-green. Another building in the same city is tinted in blue (!)—the relic of a former régime—and the effect is so depressing that one experiences a sensible feeling of relief and renewed joy on once more regaining the outer air.

A combination beyond further desire is to be had by coloring the wainscoting and woodwork a deep olive, the walls up to the molding a middling sage-green, and, above that, the walls and ceiling a lighter and neutral stone-green; this combination, of course, with the real slate board. It goes without saying that this coloring shall be "dull finish."

A striking fact is to be noted just here. The blackboard, the recipient of endless obloquy at the hands of the aesthetic, ceases to offend where the walls are rightly tinted. Indeed, real slate "blackboard" is never black at all, but a pleasing, quiet gray that has no quarrels. It is only a glaring white wall that thrusts the blackboard

into undue prominence, and thus makes it a scapegoat for a fault not its own. Speaking of blackboards, the various experiments in tinting the board have proved anything but satisfactory. The logical and satisfactory combination is a tinted wall and a board of natural slate-gray. A room thus finished is fundamentally beautiful, and is not in urgent need of any further decoration. Speaking generally, we may say that a room properly tinted is nine-tenths decorated.

I remember one school particularly, in Andover, when George E. Johnson was in charge. It had not exactly the "dim religious light," but a quality of air and color which one's home has, if he has a home. Its rooms were as cool as the aisles of the woods, and as mellow; rooms that seemed to have, in themselves, a personality, and to be sociable when empty. I used to think that not even a Jukes would play truant from such a school as that; and that no teacher, be she ever so mediocre, could quite annul the beneficence to the pupil of such a surrounding.

Regrettably, in the much-discussed topic of school decoration, this matter of wall-tinting has been rather slighted, the emphasis falling more upon pictures. This is partly due to the mad overproduction of the penny prints. With many a teacher the problem of wall decoration seems to lie in how many penny pictures she can arrange on her white plaster wall, in friezes and borders, diamonds and circles. There is a principle in composition, very easily understood, which will serve us as a guide upon this point. It is that an aggregation of small, unrelated spots is distressful to the eye and scattering to the attention. It would be disastrous to one's equanimity to try to listen to a score of people, all shouting at once messages of unlike import. The nerve-racking effect of such a babel is precisely comparable to that produced by a motley collection of picture spots, scattered over the wall in a "promiscuous arrangement," as an old textbook writer used to say. In composing his picture, an artist is governed by certain principles of composition, the chief of which is what Ruskin calls "principality," whereby all the elements of the sketch fall into an obedient relation to one dominant feature. The minor color spots in the composition do not exist for and in themselves, but rather as organic parts of the entire sketch. In a very rough and general way, we are to con-

ceive our wall just as the artist does his sketch, and every picture that goes upon it is to be subordinated in an arrangement having in view the appearance of the entire wall.

The first step in this direction is to gather up most of the small pictures and set them together in panels of two or three, instead of hanging them singly, each competing with all the rest. Three penny prints which are merely a vexation to the spirit when pinned up separately, become a genuine contribution to the decorative scheme of the room when they are grouped upon a single panel of mounting-board, first having their margins cut away.[1] And even in the grouping of these separate pieces on their mount we are yet answerable to the laws of composition. The intervals between the pictures must be less than the margins around them. Otherwise a centrifugal effect is had, and that is weak composition.

If now we have two or three panels of the sort just described, together with a larger print or two of a kind referred to later, we have ample material for our wall decoration. By all means refrain from overcrowding your walls. Remember that, while in a salon exhibit the problem is to get all the pictures up, ours is a distinctly different one. It is to regard our wall as a unit, whose hangings must only confirm its unity. And let us rid ourselves, at the outset, of the prevailing didactical idea that we are "decorating" for the purpose of instruction. Nothing can be more ruinous to the decorative scheme than to start out with this purpose uppermost. The underlying need is that the pictorial embellishment of the wall shall present a few simple and well-asserted claims upon our attention, rather than many and divergent ones. A scattered rabble of small claimants results in a dissipated attention, and this means nervous headaches and kindred things. It is a common experience to leave an art gallery with a backache or headache, or both; associated with aching feet and a general nervous depression. And this condition is not a mere physical fatigue resultant upon walking, but a nerve exhaustion following upon a sustained attention to a great number of hangings, diverse in size, shape, color, and subject, and having no mutual reference.

[1] For these mounts a material called "cover paper" is to be had at the wholesale paper houses. It costs about two cents a sheet (22 × 28), and, offering every variety of delicate gray, neutral green, etc., is both cheaper and better than the regular mounting-board.

The subject of frames is not so easily traversed. We may say, however, that, for school purposes at least, it is safest to avoid gaudy and heavily gilded frames. The small passepartout framing is all that is needed for prints and for most small color pieces. And there is the argument for economy in its favor in that it may easily be done by the teacher herself, or by the more skilful pupils.

As to frames and mats in general, it is well to remember, with Ruskin, that the frame is "a little space of silence"—between the picture and the wall behind it. Where the wall presents one uniform tint it is not really so necessary that the frame should be neutral and "silent" as in cases where patterned wall-paper is used. But the general rule is to be held in mind that the frame is subservient to its picture and should not be too clamorous in its own right. Those ornate golden halos that are given away with pounds of tea are by all means to be avoided. The frame, in all ordinary cases (such as ours), should be exceedingly quiet and say little for itself, remembering that it is but a frame, after all.

We are now confronted with the problem of the selection of our pictures. First of all we perceive the danger of hanging colored chromos, or paintings. Because only cheap ones are within our means, they are tolerably certain to be bad. And, good or bad, their color schemes will more likely than not quarrel viciously with our wall tint. Thus limiting ourselves mainly to black and white, we may go a step farther and say: Throw out the half-tones, as far as we can afford. A half-tone is the style of print seen in the penny pictures and in most of the ten-cent magazines. It is just what its name implies—it is a print that has lost half of its tone, or virility of light and dark, in the process of reproduction. Examine any penny print under a hand-glass, and we perceive it to be cut up into microscopic dots. Compare it now with an etching, a photogravure, or a pen-and-ink, and this loss of tone is instantly appreciated.

Fortunately there are better things within the reach of the poorest of us. Most of the big art publishers issue, under various names, photogravure-like prints of the world's finest pictures. These are large, fine productions, generally on plates $22 \times 28$ inches, and they have all the depth and richness of tone of the photogravure. They are had in either black or sepia at the remarkably low price of fifty

cents apiece. Such a picture, with its white border cut away and suitably matted, even in passepartout, is good hanging for the king's audience chamber. The generous size of these productions makes them especially appropriate for the schoolroom wall. One or two such pieces, well selected as to subject and reinforced by half a dozen smaller things, etchings or pen-and-ink drawings preferably, are enough for any classroom. By all means avoid overloading your wall and making the onlooker strabismic with a motley display.

But the most important consideration of all is as to the subjects we select. Let us avoid reading our own preferences too unreservedly into the children, and becoming their self-appointed proxies. The children have not that sense of historical values which is always in danger of giving their seniors a bias. We have not quite learned to distinguish between that which is imposing, from the art curator's standpoint, and that which is inherently beautiful, regardless of its niche in the lore of art. It is one thing to stock a museum of art with the conspicuous milestones of art history. It is quite another to decorate a children's room with things intrinsically beautiful—and beautiful *from the child's view-point.* Imagine, for instance, dutifully hanging "Mona Lisa" in a grade-room, simply because Leonardo did it! The pedagogical rush for Italian women, particularly madonnas, has developed into a craze, on the perfectly logical basis that the mother-and-child sentiment is appropriate to our purpose. We have merely been guilty of a little oversight in not directly perceiving that the mature and more or less ascetic conceptions of the Renaissance Italians, catering directly to the churchly ideals of that period, are not very well calculated to provide acceptable mamma pictures for twentieth-century American babies. A sentiment of mother-love—yes, but it must be a mother-love that he can recognize. He draws a keen line between sanctity in a niche and a genuine, unposeful motherhood. And so I say again, if our purpose is decorative rather than didactic, let us gather intrinsic, and, if necessary, unsigned, beauty, rather than the mélange of the art museum.

Then again, the masters, who spoke first of all in color cannot be represented in the remotest degree by printer's ink—particularly in the half-tone; and all this bowing and scraping before "penny prints

of the masters" is about as near the real spirit of art as idol-worship is to genuine religion. Supervisors of art and students of any sort who address themselves to the educational problem are fearfully apt to mix up their academic acquirements with their native appreciation until they mistake one for the other, and so disqualify themselves for the work in hand. A while ago an inquiry was sent to several dozen artists, teachers, presidents of civic clubs, etc.—men and women who presumably had the matter most at heart—as to what pictures they would recommend for school decoration. The answers, invariably cordial and enthusiastic, almost with one voice placed the "Sistine Madonna" at the head of the list! No stronger evidence could be presented of the incubus of hopelessly academic bias under which the subject rests. "The best in art is none too good for the children," wrote Dr. Klemm. While everybody must agree heartily with this sentiment, what a curious miscarriage of ideas it is to set up the subjective and subtle as the one antithesis to the mediocre! Mr. Vickery, of San Francisco, sounded a hopeful note in declaring that "a good poster is infinitely better than a mediocre engraving." Ellen Gates Starr said: "Almost anything of Millet's is good;" and then, endorsing the mother-and-child sentiment for primary rooms, she shortly mentioned Millet's "First Step," where others had chosen the "Sistine Madonna."

If we must have madonnas, why may we not take those three or four in which the mothers are in love with their babies and the babies themselves are kissable? Name over Feruzzi, Murillo (that one in the Pitti Gallery), Froschl, and, above them all, Courtois, and, I take it, we have about finished the list. And yet, of these incomparable painters of mother and child, three out of the four are unheard of in the levels where they would win their deserved appreciation if introduced. Add St. Anthony, with his strong natural appeal to adults and children alike, and the rest of our wall we need for less exalted subjects.

If we can once bolster up our common-sense with enough moral courage to leave off this indiscriminate goose-marching after madonnas, even the penny prints, which have come in for such ill-usage in this writing, will have their uses. Just think of Millet, Breton, and Dupré, with their fine realities; Adan and Meyer von Bremen,

with their rollicking German sunshine, a ten minutes' bath in which is as good as a day in the country; Sir John Millais and Sir Joshua Reynolds with their galaxy of matchless little maids; and finally Jacques with his sheep, and Barber, Carter, and Adam with their household pets. Think of this diverse and all-satisfying company being put out of countenance and being thrust against the wall, so to speak, by an undifferentiated group of pallid and poseful madonnas, scarce a quartet of whom could either love or be loved, by the most amiable stretch of the imagination! Rather let us be at once exoteric and generous, and give the madonnas over to the sophisticated and tempered academician, to have and to hold for his very own.

Summarizing, let us leave out the mawkish pictures, on the one hand, and the too subtly religious ones, on the other, and make our choice among the sane, joyous, lovable things that are so readily to be had. The principles which nowadays guide us in the selection of children's literature have only to be applied in this question of children's art.

In every schoolroom there are jogs in the wall, narrow intervals between windows, etc., which are not adapted for the hanging of pictures, but are just right for the placing of plaster casts. Since these, even of the Della Robbia order (which have always been chosen with the madonnas), do not carry a particularly emotional significance, as do pictures, we shall have to base our selection upon somewhat different values. Their first utility is purely decorative, having in view the general scheme of the room; so that the shape, size, and general appearance of the piece have perhaps as much to do with our selection as the subject itself. The beautiful "Flying Mercury," for instance, is altogether too fragile to introduce into any schoolhouse. And any statuary for the classroom, however robust in its lines, should invariably be placed above the six-foot level. Busts of authors and statesmen are as suitable as any others, not with the idea that many children will exhibit an intelligent affection for them, but that they will pleasantly finish the appointments and the color scheme of the room. To do this these casts must, of course, have the ivory finish, which costs no more. Nothing (save a blue wall) is quite so persistently ugly as a plain plaster cast. Even the inevitable dust of seasons does not soften its harsh unfriendliness; and, on the

other hand, there are few color spots in the room more grateful to the eye than the embalmed sunshine of a bit of ivory-finished statuary.

Vying in importance with the pictures in the schoolroom are the plants. A sage-green room with a table full of growing things by the window is an abode of joy, pictures left out of the question. And the effect is greatly enhanced if there be, beside the plants, or embowered among them, a little aquarium with a goldfish dawdling in it.

A clever device for the purpose is in use in Stockton. The potted plants are set upon an ordinary cheap table, except that the top is zinc-lined and sunk in for an inch; or, in other words, the edges of the top are raised that inch, making a shallow, zinc-lined trough. The flowers can thus be watered without any danger of leakage, or of unsightly, warped table-tops.

Draperies in the schoolroom—except window curtains, periodically washed—are universally condemned by all who have given the matter thought.

There is some diversity of opinion concerning animals in the schoolroom. Much is urged against caged life before the children. A correspondent covers the question thus: "I object to having animals confined for *entertainment* of young or old, at home or at school. But this allows us some latitude, inasmuch as we may have much animal life about which is not, in a strict sense, confined. It requires an overwrought imagination to commiserate a well-tended canary, for example." A letter on the subject refers pleasantly to "a tame, comfortable kind of animal, or goldfish in a globe, in which is a water plant growing." I knew one class in which a dog or two were in fairly good attendance. They were orderly in deportment, and gave silent and continuous approbation to the whole programme. True enough, the teacher, in her frequent rounds, had to step over an occasional barrier, but I do not recall any schoolroom, before or since, where the spirit was more homelike, wholesome, and perfectly conducive to study.

# INDIVIDUAL INSTRUCTION VERSUS CLASS TEACHING

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It would appear that enough has been said in recent years upon the broad and important subject of educational method. The time certainly is ripe for us to act and endeavor in our acting to carry out the advanced idea of the present day. In theory, much of what has been wrought out is absolutely true. But the difficulty arises when the searcher who reads well and extensively upon matters of method desires to put these ideas into practice. Perhaps the question that today needs our close attention is how to put into practice those theories that relate to individual instruction.

To make it plain that in discussing the individual method of teaching we are riding on the crest of the educational wave, I will quote from an article by Dr. Petzoldt of the Gymnasium in Spandau translated in a recent issue of the *Literary Digest*. The writer urges the establishment of special schools for those particularly gifted. He says in part:

> It certainly is a fact beyond dispute that in one and the same class there are those who can do the work assigned in half the time which it takes the weaker members of the class to do it. Should they not have the opportunity to do so? Or rather, should not special attention be paid to those who promise to become the leaders in the world of thought and work, rather than to those who, in the nature of the case, can never get beyond the average in knowledge and abilities? Wisdom and not charity should be the controlling factors in the arrangement of the school curricula. Every teacher of experience knows that not a few of his brightest pupils have been seriously checked in their educational development by the fact that they were compelled to advance slowly in order that their weaker classmates might keep up with them. We believe that it will be conceded by all teachers acquainted with the condition of affairs in the secondary schools that the more gifted pupils could readily finish the nine years' course in six years, and in this way enter the universities at the age of fifteen instead of eighteen, as is now generally the case, and thus enter professional life fully three years earlier than they could under existing circumstances. True, this innovation would demand the appointment of some special teachers; but the results would

amply justify the additional cost. Let the State try the experiment of arranging special courses or schools for those who are gifted enough to do the work in less than the ordinary time.

This idea of classifying pupils according to their capability of advancement is not new, yet its constant recurrence shows conclusively that the line of educational thought today tends toward the consideration of the individuality of every child, rather than ministering to the needs of the average child, as did the older pedagogy. Nevertheless, this plan of separating pupils in schools or classes according to their intellectual strength is objectionable; for it stigmatizes the less gifted, and deprives them of the impetus resulting from contact with their brighter classmates. Can we not then devise a plan other than that of separation, whereby the pupil's promotion or progress will depend solely on his own ability, rather than on the concentrated effort of those around him?

This grouping of pupils into classes as we have them in our grammar and secondary schools has no basis but expediency. The large number of pupils and limited number of teachers require it. What is the result? When class instruction is used exclusively, the teacher gauges the advancement of the class by what the average child can do—the average child—how often he appears in theory, how seldom in real life! The same lesson is assigned every one—all are at the same page in the textbook at the same time—like work is required of each one. Does it follow that all react alike, even if they do receive the same instruction? Should they all be at the same page in the textbook? What of the bright pupil who could forge ahead? What of the less interested ones who cannot keep up with the rest? Think too of the bright pupil who has mastered the subject on your first presentation. How edifying for him to listen to your reiteration of it with a dull pupil! How many of us like to retrace our steps simply for the pleasure of the process, when we have exhausted all possibilities the first time? With this method of recitation the teacher can reach only a certain group of pupils at one time. If he direct his attention to the weaker ones, he is sacrificing the interests of the more alert. He really does most with the so-called average pupils, for they, not the gifted, set the pace for the class. It is obviously impossible for the individual child to develop unhampered

by the limitations of his fellows. All are leveled to the same intellectual stature.

But enough of the fallacy of class instruction. Now for the individual method—the panacea for all these ills.

The practical difficulty of individual instruction seems to loom up large in the question: "If you give your attention to one individual, what are you going to do with the rest?" But it resolves itself very simply into the following direction: Let your class every other day during the recitation-period devote themselves to silent written work, as has been the practice for a year in the academic and other classes of the McKinley High School.

It will be agreed, I am sure, that in every subject the child studies, he should be equally at ease in both oral and written expression, that he should be trained to equal mastery of either instrument; and that the same time should be given to both.

On the day that your pupils write, let us call it "laboratory" day, though some may object to that term—but I think it suffices—on that day, let each pupil have a certain amount of written work to do. It is not necessary, it is not even desirable, that every pupil be doing the same thing.

If the entire class up to this time has mastered sixty-nine pages in the textbook, why not let the bright pupil see what he alone can do with page 70—without your direction? That will be the very best way to review him on the previous sixty-nine pages, to see if he has developed thought-power or has only mastered facts. Has he got sufficient strength so that when he comes face to face with a new condition, he will master it—or let it master him? That is what will confront him in after life, and it is this very power of initiative that the unschooled mind so often has that gives it advantage over the trained mind. Having disposed of the bright pupil—you recollect he was at page 70—you can now give your attention to the one who rightly belongs at about page 35. Surely you recognize the economic value of this sort of instruction. The pupil who most needs your attention gets it without your sacrificing the interest of any of the others; for all are at work independently of one another.

Individual instruction, too, gives the expressional power as much attention as the thought-power. On the other hand, in class instruc-

tion when you address a question to all and call on one pupil to answer, each one should be going through a thought-process, but only one has the added advantage of expression. As a result we let the expressional power lie behind the thought power and then brand a pupil as stupid, when he is merely inarticulate.

Important as are these advantages of individual teaching, I think its final educational value is in the sympathy it fosters between the teacher and child. When you move about from one to another, and work elbow to elbow with your pupil, he will be apt to tell you his difficulties far more readily than when the whole class has to listen to his confidence. Then, too, he is susceptible to the flattering personal interest such close contact assures; he is spurred to do his best, for he knows that he himself will determine his progress—that he will march in single file, not with twenty-five or thirty abreast.

It may be said in objection, as one mentally reviews this single-file procession and notes the stragglers at the end: "Will not the work of such a class lack unity if the individuals that compose it are not kept together?" By no means—for all are working in the same line of thought, if not in the same place. Then, too, there will be checks and balances in the oral recitation that will prevent the pupil from too complete isolation. The knowledge that you obtain of your pupil's individuality by the close contact of "laboratory" day should be utilized every time you meet them—whatever be the form the recitation assumes.

That individual instruction is practicable must, I think, be conceded. It has, however, a more vital *raison d'être* than mere expediency. If we probe deeper than its every-day feasibility, we shall find this recognition of and appeal to different mental types to be pedagogically sound, because of its close correlation to the elective system of our high schools. The elective system recognizes different mental types in providing several groups of subjects; individual instruction takes note of varied intellectual tendencies in the pursuit of any one subject. Sufficient recognition, one may say, is given to the individuality of the pupil by our several courses of study. The scientific-minded boy—the one who cares for facts—has a scientific course offered him; the literary-minded student has the classic; the practical-minded—he who cares for affairs—has the

business. This is all very true, but what is one to do with these variously minded individuals, when the exigencies of school organization demand that all of them come together in the same class? For example, take the subject of English, a non-elective study in the majority of high schools. To demand the same requirements of every pupil in such a class would be inconsistent, if one admits the efficacy of the group system. Should we not get in mental accord with our pupils more quickly, see the fruit of our instruction ripen with less expenditure of effort, if, instead of narrowing our teaching to appeal only to one type of mind, we should extend and differentiate it to include all types. To exact that everyone master the same essentials is to limit our teaching power to a few; to render these requirements flexible according to the need and power of every pupil is to widen our influence to the farthest possible extent.

We have shown, we believe conclusively, that the scope of individual instruction is much broader than that of class teaching. Its chief strength, however, is in another quality—and that economy. For, is there anyone who, surveying his own educational career in retrospect, does not deplore much of its futility? Could we have been but our own teachers! Or could they who taught us have noted more closely our own peculiar type of mind, what untold benefit might have accrued to both. Progressive education is simply the effort to lessen for each succeeding generation the area of the waste places in the educational field.

In this respect, we have much to be thankful for. We no longer hold as did our ancestors that all truth and mental development is locked in the classics. The educational day that associated mental hardship with intellectual profit was a long one; it lasted several centuries. Fortunately for the cause of enlightenment it is past. Yet, how often do we meet a teacher, who in his inflexible standard of requirements, in his determination to move on all his pupils together at the same pace, and in his insistence on adapting his teaching to the average child, seems in these characteristics to belong to that somber yesterday.

That the educational world of today regards individual instruction as one of its most vital issues is attested in many ways: the quantity of literature on the subject as well as the action of one of our

universities in returning to the preceptorial system, which in itself is the recognition of the individual as an entity in teaching rather than the class.

To sum it all up in a final word, individual method of teaching bases its claim for intelligent consideration on three things: first, its every-day feasibility; second, its pedagogic economy; and lastly, its close correlation to the elective system, the value of which has been tested and proved by time.

The recognition of the pupil's individuality as a factor in his own advancement is of inestimable value to him; it arouses his enthusiasm, awakens belief in his own ability, and develops that power of initiative so vital to success in any sort of life, the lack of which, alas! is the high price so often paid for knowledge learned in schools.

# THE RHYTHM OF THE *AENEID*

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It is almost a commonplace among classical scholars that the outward form of Latin poetry is as important as the content. We admit that the artistic effect of the poem depends quite as much on the form as on the thought or feeling; yet how little attention is directed to this side of Latin verse. This disregard of the form, as compared with the thought, is a reaction from the false classicism of the eighteenth century, and is also the outgrowth of the practical spirit of American life which would grasp the substance and reject the show. But can we afford to throw away the half of the merit of Latin poetry? The thought in Horace is not as fresh for us today as it was even for his contemporaries. If he is to hold his place in literature, this must be largely due to an appreciation of the setting of the thought. And what is true of Horace is true of the other great poets of Rome.

Our traditional method of scanning has been little more than a mechanical division of the line into feet, while there was an entire disregard of the natural word-accent and even of sense-pauses. In view of such a theory well might Mr. J. B. Mayor say: "No doubt the scanning of Virgil is an easy thing and the scanning of Shelley and Milton a hard thing." While our theory has made it easy to scan Virgil, it has made it difficult to appreciate the wonderful melody of his verse.

That which is a distinguishing characteristic of the rhythm of Virgil is variety. This quality is as essential to the harmony of music and poetry as is regularity and unity. This variation from the norm of the verse is sometimes called poetic license. Many treatises have been written on the subject, but the treatise that is most to my liking occurs in a certain French work on prosody, and is in a chapter entitled "Des licences poétiques." The full text of this chapter is as follows: "Il n'y en a pas." These so-called

poetic licenses are the very breath of life of a great poem. They give it its individuality and raise the verse of a Virgil above the "correct" verse of a Valerius Flacchus, or even of an Ovid.

To appreciate the rhythm of Virgil in all its varied form, it is necessary to have in mind the normal rhythm of the Latin hexameter. This can be seen most clearly in those poets who conform closely to rule. For this purpose we may examine the verse of Ovid who for elegance and finish of workmanshipi s unsurpassed. Ovid, however, shows to a considerable extent the influence of Virgil, and he is not averse to the introduction of the Greek rhythm. The most intensely Roman in spirit and form is Lucan.

My subject is so broad that I shall be able to state only a few facts—dry and uninteresting I fear they will appear in themselves —but I hope that the reader's application of them may give new interest and meaning to one of the world's great masterpieces.

In the following remarks I shall take for granted that the hexameter involves an appreciable stress on the arsis, or strong part of the foot, and that the accent, such as would exist in prose, is an element of the verse-structure and affects the rhythm.

If we examine the verse of Ovid or Lucan, we find that the relation of the word-accent to the verse-ictus conforms to very definite laws, and that the laws are different in the different parts of the verse. In the second and third feet we have contrast of accent and ictus; in the fifth and sixth, coincidence of accent and ictus. The first and fourth feet, which are the connecting links between these contrasted rhythms, allow either contrast or coincidence. The first foot is almost as much a connecting link as the fourth. We are not to consider hexameter verse as made up simply of lines, but of groups of lines forming units which again are united into larger units. To make the contrast clear between the second and third feet and the other feet of the line, it is only necessary to remember that a single word cannot form either the second or third, but may form any other foot. This rule applies without exception in Ovid and Lucan. Virgil however in a few instances admits a dactylic word or ending, in the second foot.

The contrast of accent and ictus in the second and third feet involves the principle that the word-accent on the thesis shall be

stronger than that on the arsis. In the application of this principle we must take into account secondary accents at the beginning of words, as well as the primary accents. These secondary accents are in evidence in the language from the earliest to the latest times.

When the thesis has only a secondary accent, the arsis of the foot is usually the final syllable of a word of two or more syllables, and is thus without accent. When two monosyllables form the foot, the accent of the first is less prominent than that of the second, as in

| *et ius* | *est.*

The effect of these general laws of accent is to give to the first part of the line an even, sustained flow, while the close has a more pronounced cadence. We may often observe a similar tendency in English verse, as in:

Thy extreme hope, the loveliest and the last.

In the long hexameter line there is ample opportunity for variation of rhythm. We may compare the contract of cadence in the first and last part of the following quotation with that of an hexameter line:

When you do dance, I wish you
A wave o' the sea.

When, owing to elision, the word-accent falls on the arsis, the thesis has a primary word-accent, and the word to which it belongs is emphatic and is usually a noun, as in *revo|cate ani|mos*, or *exe|gere en|ses*. Lucan admits no exceptions to this rule, and Ovid but few. Virgil's method is in general the same, but exceptions are not infrequent. In lines such as:

Monstrum horrendum informe ingens, cui lumen ademptum;
—iii. 658.

Huc illuc vinclorum immensa volumina versat,
—v. 408.

the unusual coincidence of accent and ictus gives a special weight to the rhythm and re-enforces the thought.

When we compare the poet's method of dealing with dactylic and spondaic feet, we find that the rules are much more strict for spondaic feet than for dactylic. We have already noted that Virgil sometimes forms the second foot with a dactylic word or ending, but never with a spondaic word or ending. A spondaic word is used

with special restrictions in the first foot. It is an unemphatic word, like a conjunction, and would not have a prominent accent; or it is a word closely connected in thought with the following word, so that it would appear not so much as an individual word, but rather as a part of a word-group; or it is a word of special emphasis and used for rhetorical effect.

The spondaic word in the fourth foot is subject to even greater restrictions. In Ovid it is preceded by a monosyllable which is long in quantity, is subordinate in thought, and is accordingly without a prominent sentence-accent, and it is closely related in thought to the spondaic word. The monosyllable is usually preceded by a sense-pause, which is more or less marked. The monosyllable accordingly forms a sort of anacrusis, introducing the new clause. In a few rare instances, with a view to rhetorical effect, Ovid uses in place of the unaccented monosyllable an emphatic monosyllable. Virgil sometimes admits a pyrrhic word before the spondee. He is, however, careful to have the pyrrhic preceded by a sense-pause. The impressive effect of this rhythm is illustrated in the passage describing the death of Priam:

> Regnatorem Asiae. iacet ingens litore truncus
> Avolsumque umeris caput et sine nomine corpus.
>
> —ii. 557.

We may notice in passing two other departures from the norm of the verse. The arsis of the second foot has the word-accent, and the second line is divided into two equal parts. I am aware that many of our "authorities" would favor placing the caesura after *umeris* or *et*, but if the verse is written to convey the thought it seems only fair to demand that it should be so read as to express the thought. But this principle will not justify us in dismembering the clauses. Such realism is not favored even in Roman art.

It has already been implied that word-groups, as well as words, must be taken into consideration in our reading of Latin. If we disregard this fundamental principle of language, our reading of Virgil will be on a par with the reading of the beginner in English who appears to be reading a list of words and not sentences expressing thought. In general the accent of word-groups, or stress-groups as they are sometimes called, is more variable than the accent of

individual words. The former depends largely on the desired emphasis, the latter on tradition. In the sentence, "Give me the book," we may accent only the first word or we may accent "give" and "book." In Latin the accent of word-groups does not conform to the principle which determines the accent in English. In our own language it depends on emphasis; in Latin it conforms in the main to the law of accent which governs individual words. The accent of *pro me* is on the first word, but in the English "for me" it is on the second. In *inter se* the accent is on the final syllable of *inter*. Accordingly the first two syllables of the word-group *inter se* may form the second foot, but the last two cannot be so used. In the latter case the effect would be to have a spondaic ending, which is not allowed in that part of the verse.

In word-groups monosyllables and dissyllables are the only words the accent of which recedes upon the preceding word. In order that two words may form a word-group it is necessary that they should be connected in thought. When two words are frequently used together the sentence-accent may entirely replace the individual word-accent. In some cases it is difficult to say whether such a combination should be classed as a compound word or as a word-group, as *si quis*, *huius modi*. In either case they are pronounced with one main accent, which is determined by the regular law of word-accent. Words which do not have a prominent accent in the sentence, such as sentence-enclitics, most readily unite with another word under one sentence-accent. Recession of accent is also favored by having a monosyllable as the first element of the word-group.

Let us now see whether the structure of the verse recognizes this recession of accent in the case of monosyllables. A very few figures will be sufficient to answer the question in the affirmative. Of Ovid's hexameters 155 end in a monosyllable. Of these 144 are preceded by another monosyllable. These monosyllables are as a rule closely connected in thought, and the second is in nearly every case a sentence-enclitic; in 61 lines it is the enclitic *est*. When, on the other hand, the second or third foot is formed by two monosyllables they are not so connected in thought as to form a word-group. In most cases the sense-pause between the two monosyllables is so marked that it is indicated in our texts by punctuation.

In the first four books of the *Metamorphoses*, for example, in the majority of cases a monosyllabic form of *esse* is the arsis, and the thesis is a monosyllable which belongs to a new clause.

Such a line as the following is very unusual, even in Virgil:

> Demoror, ex quo me divom pater atque hominum rex.
> —ii. 648.

The emphatic noun at the end of the line is exceptional, but not more so than the word-group *ex quo*, which forms the second foot. *Demoror* is made emphatic by the sense-pause, which comes after it at the close of the first foot. The force and effect of such a line cannot be appreciated when taken out of the context.

As the fourth foot allows the accent to fall either on the arsis or thesis, greater freedom is allowed in the use of the monosyllables. If the foot is formed by two monosyllables which are so united in thought that they may form a word-group, the foot is subject to the same restrictions which apply in the case of the spondaic word in this situation. Usually the monosyllables forming the fourth foot are subordinate words. We find in Ovid's verse that when one of these monosyllables is more emphatic it is the first. The accent will accordingly fall on the arsis and the rhythm of the foot will correspond to that of the fifth and sixth feet. Virgil's method in the *Eclogues* and *Georgics* corresponds to that of Ovid, but in the *Aeneid* we may note a marked change. Here the first of the two monosyllables is often a sentence-enclitic united by elision to the preceding word, and the second monosyllable is emphatic. The marked difference in the rhythm which results from this change of accent in the fourth foot is readily felt. Compare

> Saepe malum hoc nobis, si mens non laeva fuisses,
> —*Ecl.*, i. 16.

and

> Obstupui steteruntque comae et vox faucibus haesit.
> —*Aen.*, iii. 48.

An examination of the use of pyrrhic words strengthens the conclusions which we derived from our consideration of monosyllables. When a pyrrhic word is used in the thesis of the fifth foot it is regularly preceded by a monosyllable. The two are regularly related in thought, and the pyrrhic is apt to be a word which would have

a light sentence-accent. Some poets admit only such pyrrhic words as would naturally form a word-group with the accent on the first syllable, as *dc simul*.

The rules for the pyrrhic in the second and third feet are the opposite. In Ovid and Lucan the pyrrhic is rarely preceded by a monosyllable, never by one with which it can form a word-group. Even when preceded by polysyllabic words it is regularly separated by a sense-pause.

Virgil's method in the use of pyrrhic words in this part of the verse is interesting. In the *Eclogues* his usage corresponds to that of the stricter poets. In the *Georgics* he is somewhat freer, while in the *Aeneid* his method has entirely changed. Here the pause comes as frequently after the pyrrhic as before it. When, however, Virgil thus departs from the norm of the verse, he regularly introduces a strong sense-pause after the pyrrhic, so that the change of rhythm may be clear to the reader. The following lines illustrate the difference between these methods:

Exciderant ani | mo; manet | alta mente repostum;
—i. 26.

Sarpe | don, ubi | tot Simois correpta sub undis;
—i. 100.

In pup | pim ferit | ; excutitur pronusque magister
Volvitur | in caput | ; ast aliam ter fluctus ibidem.
—i. 115 f.

The cadence of the first two lines seems especially adapted to the expression of the gentler emotions, while that of the last two lines is more forceful and abrupt.

I should gladly omit the consideration of the iambic word. The subject is not an easy one to dispose of in a paragraph. I note a few facts and ask you to draw your own conclusions. In Lucan there are upwards of 2,000 examples of a trochaic word, or ending, in the second and third feet, and in every case it is followed by an iambic word. In nearly all cases these two words are closely related in thought, and in no case are they separated by a strong sense-pause. The union is made more marked by a sense-pause which regularly follows the iambic word. The iambic word is also very frequently a weak word such as a sentence-enclitic. The same general rules prevail in Virgil. I have noted 45 exceptions, but

these occur under special conditions, often in connection with Greek words and the feminine caesura, and are Greek in rhythm rather than Latin.

What is the explanation of these striking facts, or in other words what is the rhythm of the following lines?

> Sergestus capit | ante lo | cum scopuloque propinquat,
> Nec tota tamen | ille pri | or praeeunte carina.
>
> —v. 185 f.

It is generally agreed that the accent of *ante locum* is on the ultima of *ante*. Is not the accent of the corresponding foot in the second line apparently the same? If we assume the recession of accent of iambic words, the rhythm of the verse is uniform and we have the chief word-accent on the thesis of the second and third feet. On the other hand it is to be noted that the iambic word is often an emphatic word which under ordinary conditions would retain its accent. Shall we recognize the general rhythm of the verse as sufficiently strong to counterbalance the natural prominence of the word? This supposition does not involve a principle which is contrary to the laws of Latin accentuation; it merely emphasizes certain tendencies of the language, just as the rhythm of English poetry brings out the latent possibilities of the language but does not go contrary to its laws, as when it accents the final syllable of "pitiful" or treats "doomed" as a dissyllable.

Another important element in the rhythm of Latin poetry is the elision. Few poets have used it so freely as Virgil; none have used it with such artistic effect to heighten the rhythm and to give weight and impressiveness to the thought. The effect of the elision can be gained only when both vowels are sounded. Elision denotes not the dropping of a vowel, but the union of a final vowel with the initial vowel of the following word in such a way as to give the value of a verse-syllable.

Where a sense-pause occurs between vowels forming elision the usual custom has been to disregard the pause in reading. This method does violence to the thought, and is opposed to our methods of reading modern poetry. The structure of Latin verse shows also that the sense-pause was observed in reading. When the syllables forming the elision are closely related in thought the second of

the two forming the elision may receive a strong accent, as in *ante ora, tumida aequora*. In the first book of the *Aeneid* alone there are 54 such cases.

When a sense-pause intervenes between the syllables forming the elision, the second of the two syllables in elision does not receive a marked accent. The second element of the elision is a word which does not receive an accent on the first syllable, as *Italiam*, or it is a sentence-enclitic, as *et, atque, aut, ut, in*. These words would not have a sentence-accent in Latin any more than the corresponding words in English. The only exception in the first book is:

Laetitiaque metuque: avida coniungere dextras.
—514.

The rhythm of this line is as a whole Greek rather than Latin. The accented syllable is short, and its accent would not be so prominent as in the case of the long syllable. Most of the exceptions to the rule occur in connection with short syllables.

This book may be taken as typical of the usage of Virgil in respect to these two types of elision. Viewing Latin poetry as a whole we may say that when the words forming the elision are closely united in thought, the second element of the elision very frequently has a strong accent, but that when the elements of the elision are separated by a sense-pause, it does not receive such accent. There is almost no exception to the rule that in epic poetry the second element in pause-elision is not an accented syllable.

We may illustrate the method of reading these lines with pause-elision by reference to Milton. The great English epic poet is the best commentator on Virgil. While Tennyson so much resembles the Roman poet, not only in spirit and temper but also in the essential characteristics of his diction, it is to Milton that we must go to find the same grand cadence. We may compare

Bella gero. et quisquam numen Iunonis adorat
—i. 48.

with

Strange horror seize thee, and pangs unfelt before.
—*P. L.*, ii. 703.

The reason for the unaccented syllable as the second element of the elision is readily appreciated. The first syllable blends with the

pause, and the second rises from it and completes the verse-syllable. The verse-syllable thus formed by elision may be compared with a note with falling followed by rising tone, or with a syllable pronounced with falling followed by rising inflection. The pause does not destroy the unity of the syllable any more than other pauses destroy the unity of the foot in which they occur.

One of the most exceptional cases of elision occurs in the following:

> Excisum Euboicae latus ingens rupis in antrum,
> Quo lati ducunt aditus centum, ostia centum.
>
> —vi. 42.

This is the beginning of the description of the cave of the Sibyl, and to prepare our minds for its mysteries the subject is introduced with an unusual rhythm. In the first line we have the fourth foot formed by a spondaic word preceded by a pyrrhic. The latter is not, as usual, preceded by a sense-pause; in fact there is no natural break in the whole line. The latter part of the second line is thrown into rhetorical form and this, in connection with the main theme, justifies the accented syllable as the second element of the pause-elision.

In conclusion I will give one more illustration of Virgil's method of imparting variety to the cadence of the hexameter:

> Sic omnis amor unus habet decernere ferro.
> Diripuere aras (it toto turbida caelo
> Tempastas telorum ac ferreus ingruit imber).
>
> —xii. 282 ff.

In the second and third lines we have the elision in the thesis which throws the word-accent on the arsis. In the second line the spondaic word in the fourth foot is preceded by an emphatic word. These two lines well illustrate Virgil's method of uniting two lines connected in thought into a couplet which is characterized by a general similarity of rhythm with minor variations.

We may note too how the rhythm and melody of the verse are colored by the vowel and consonant combinations. In the first line we have the contrasted vowel sounds *o* and *a*, *u* and *a*, at the beginning of the words, and the third line ends with words beginning with the similar sounds *in* and *im*. In contrast with the assonance at the beginning and end, the consonant prevails in the intervening part. At first we have the prevalence of the *r*-sound. This sound

is especially prominent in Virgil in passages which describe violence and ruin. In the rapid succession of the sharp *t*-sounds we hear the very clatter of the falling shafts.

The rhythm of the Latin hexameter cannot be appreciated without reference to the accent of the word-group; and this accent is an essential element of the verse. The facts which I have pointed out in regard to the verse are of importance, even if my interpretation of them is not accepted in all cases. In the words of Horace:

> siquid novisti rectius istis,
> Candibus inperti: si nil, his utere mecum.

For those who desire to pursue the subject further I would refer to the following: on ictus a suggestive article in the *American Journal of Philology*, Vol. XIX, pp. 361 ff., Vol. XX, pp. 198 ff., 412 ff., on sentence-enclitics, Lindsay, *Latin Language*, pp. 165 ff.; on certain word-groups, *American Journal of Philology*, Vol. XXV, pp. 147 ff., and *Transactions American Philological Association*, Vol. XXXIV, pp. 60 ff.; on the relation of accent and ictus in the fifth and sixth feet of hexameter, *Ibid.*, Vol. XXXIV, pp. 26 ff., Vol. XXXV, pp. 10 ff.; on the spondee in the first foot, *Wiener Studien*, Vol. XIX, pp. 1 ff. My conclusions on other subjects discussed in the paper are based on material which I have collected in the course of my own studies. I have discussed pause-elision in *Transactions of American Philological Association*, Vol. XXXVI, pp. 82–102, and certain points to which I have here referred I hope to take up more in detail in *Classical Philology*, beginning with the January number.

## A NEW MOVEMENT AMONG PHYSICS TEACHERS

### CIRCULAR III

Notwithstanding the fact that the answers to the questions in Circular II were asked for during the summer vacation, when a teacher wishes to be rid of all thoughts of teaching, 130 answers were received. These came from 83 high schools, 9 normal schools, and 38 colleges. The geographical distribution of those who answered is very similar to that published in the last circular, nearly every state in the Union being represented.

The tabulated summary of the answers received is as follows; the numbers in parentheses indicate the number of votes in each case:

Question 1. The replies to this question concerning the best methods of keeping notebooks were generally very full, showing that a large amount of attention is being given to this important matter by the teachers.

Many believe that the student should not be asked to make out his own form of report (9), but should record his results in printed tabular forms (25). On the other hand, others think that the printed forms should not be used (35); but that the student should be required to work out his own form after a few weeks of drill and experience under the guidance of the instructor (60). It is suggested that if the student is encouraged to describe his work in his own way—so that he feels that he is book-making rather than book-keeping—he will take pride in his work (8), and he will record only work that is distinctly his own (9). In any case, the report must be concise (12), well systematized (11), contain no descriptions of apparatus (9), no drawing (9), no details of the method of performing the experiment (5), and no copying from the manual (5).

The time of the teacher may be saved by having the student hand in his results immediately and having them inspected during the laboratory period (24); in which case a loose-leaf manual or notebook, with drawing of the apparatus but not much description of the experiment, is desirable (22). Time may also be saved by using the graph for tabulation of data (6); by so co-ordinating the experiments that the result of one checks that of another (2); by not requiring the student to attempt to write a description of things he does not understand (3); and by letting the student give oral explanations instead of written ones, the data and conclusions only being recorded (3). Three suggest that only one out of six experiments be written up in full, the rest being reported on tabular printed forms.

As to the minimum requirement, four vote for 40 experiments, five for 30, and ten for 20; it being understood that these are all quantitative. Six urge that

no notebooks be required by the colleges for entrance, but that the certificate of the school be sufficient. The minimum record for a report of an experiment should contain: (1) purpose (34); (2) list of apparatus (12); (3) drawing or diagram (21); (4) description of the method of work (27); (5) tabulated data or results of measurements (33); (6) discussion of data and conclusions (35); (7) discussion of errors (5); (8) answers to questions by the instructor (2); (9) historical notes (1); and (10) meaning of experiment to student (2).

Question 2. Every one of the answers to this question stated that the amount of subject-matter usually compressed into the one-year course is too great. The methods of reducing it may be summarized as follows:

By omitting either the parts that are largely mathematical (21); or the more abstract parts (17); or the less essential parts (20); or one whole division of the subject (13). We might also cut out descriptions of antiquated apparatus (3), fads (4), special rules (5), work belonging properly to the college (4) or to the technical school (5). We should introduce only the simplest and most necessary units (3); omitting the dyne, the erg, the poundal, etc. (7). We might also omit the parts that are not easily understood (7), suppress all unnecessary detail from the textbooks (3), and reduce the discussion of mechanics to half the space usually given it (2).

Simplification might also be obtained by a better organization of the subject-matter (7); for example, by making the idea of energy the center and grouping the other material about this (4); or by intensifying the parts that are immediately connected with the student's life (7). The facts and laws studied should be limited to fundamentals—no physics curios (6), or to facts which clearly relate to the life of the students rather than to the laboratory (5). There should be more laboratory work on fewer principles (2), more study of phenomena first (15), and no principles should be given till the phenomena which they resume are clearly grasped (5). We should evaluate the work less by the amount of ground covered and more by its quality (3). It might also be well to conduct the course by assigning no lessons from the text, but rather giving a series of problems that necessitated for their solution a study of the text (2). A course might be devised consisting simply of forty typical experiments with questions and problems on the practical application of the principles involved (2). Others think that the reduction should be different in each school, being left entirely to the teacher (3).

Some claim that the method of presentation is vastly more important than choice of subject-matter, so that a few things well presented are of more value than a large number poorly done (7), while others claim that it is important to give a general survey of the whole field, even though parts of it are not appreciated at the time (2).

Question 3. Of those who answered this question, 47 prefer to have physics in the fourth year, 25 want it kept in the third year,

and 12 want it in both. Fourteen suggest that there should be a simple descriptive course in the first year, to be followed by the present course in the fourth.

Question 4. The vote on the question as to how much of the time should be spent in laboratory work was as follows: one-fifth (5), one-third (28), two-fifths (28), one-half (33).

Question 5. This question brought out many valuable suggestions as to what the associations might do to help the teacher in perfecting his work. Some of these are as follows:

The associations should organize a campaign for the education of the public, the superintendents, the principals, and other school authorities concerning the conditions necessary for efficient work in physics; namely, the teacher must have a free period immediately before a demonstration lecture (17); also time to prepare for the laboratory work (18); also, because of the time required for the satisfactory care of the apparatus, he should have one hour a day less teaching than those who do not have to work with apparatus (29). Statistics should be gathered as to the weekly hours of work by physics teachers and by others (28), and also concerning the apparatus and equipment of the schools where satisfactory work is done (3). Membership in an association should give a teacher rank and standing (9); so that people recognize that he is not the mechanician, carpenter, janitor, and scrub-lady combined (2). Through the associations the teachers should also control the ways of entering the profession, as is done in medicine, law, theology, etc. (4). One suggests, "Why not have a Union?" The associations could also help in insisting on double periods for laboratory work (4), and in securing more time for the subject in the curriculum (2). They might also unite in the production of a satisfactory text (1), and in helping the teacher to free himself from set forms and syllabi (7).

The colleges might also be reached by the associations, and persuaded to accept for entrance the work done by the high schools as the high-school teachers see fit to do it (19); and to lay more stress on the quality of the work rather than on its quantity (8)—perhaps they might be seduced into accepting twenty topics well understood in place of forty experiments as the *sine-qua-non* of entrance.

The associations could assist the teacher by publishing a teachers' manual (8), by issuing circulars telling how experiments may best be done (3), and by keeping up the present agitation (10).

Question 6. Many possible forms of syllabus were suggested in answer to this. Although two think the syllabus a delusion and a snare, most believe that one might be framed that would help rather than hinder the teacher. Here are the suggestions:

The syllabus should consist of a number of fundamental principles, together with a requirement of the comprehension of a certain minimum number of them,

and a long list under each of means and methods of teaching that principle; and then leave the teacher free to select both the principles he will teach and the means of doing it (26). It should be intensive in each subject and require only 60 per cent. of it (3). The syllabus must contain a much larger number of experiments than required for a year's work, and leave the teacher free to select (22). Such a list of experiments should be accompanied by an obligatory minimum requirement (4), but it must be flexible (15), and allow substitutions (10). It might outline the essential parts, giving references, and let the teacher fill in (5).

Instead of a syllabus, it might be better to approve a score of textbooks, and trust the teacher for the rest (3); or, we might simply draw up a comprehensive and varied list of questions for the pupil to be able to answer (3). Only about half of those who replied attempted to answer this question.

Question 7. The purpose of instruction in physics is a matter on which there is wide diversity of opinion, as may be seen from the following summary of the replies:

Physics instruction should bring the student into intelligent touch with the world of natural phenomena about him (30), give him some comprehension of the working of practical and familiar things (17), increase his knowledge of fundamental facts (14), teach him the fundamental laws of physics (18), rationalize his knowledge of phenomena (7), show him that Nature works by law (10), reveal to him the vast extent of the unknown (2), and bring him to appreciate the limitations of experimental accuracy—man's handicap (2).

Such instruction should also develop reasoning power (26), logical thinking (2), ability to detect and use laws (9), interest in the applications of laws (6); powers of close observation (15), of interpreting observations (15), of solving problems for himself (6); and powers of doing things and of taking the initiative (5). It should also foster the scientific method of thought (14), arouse the imagination (2) and the love for beauty and truth (3); it should develop accuracy in measurements (6), computation (5), and expression (4). It should show him the value of accuracy (2) and of quantitative knowledge (2), and the desirability of testing things by measurement (3). One suggests that the first six or seven months' study should be purely informational, and the rest review, since reasoning begins later. Two others lay stress on showing the student that scientific knowledge increases our power over things by enabling us to predict what will happen under a given set of conditions. Finally, two think the purpose of the physics course is to teach physics.

The most important suggestion as to the method of testing whether the aim of the course has been attained is this: that the teacher observe the pupil and study his work (18), and then judge his acquirements by his interest in physics problems outside the laboratory (6), and his power of solving simple original problems (7). It is suggested that there should be frequent short tests (10), careful inspection of the notebook (9), and a final examination (5) which is framed to test power of thought rather than memory (4). One suggests that a committee of the asso-

ciations should frame the examination questions, which should concern themselves with broad general principles only. Three others call for no final examinations, but suggest quizzes on practical subjects. Five want the colleges to accept the certificate of the school without special examination by the college. Five others suggest as a suitable form of examination the requirement of the description of a new machine or piece of apparatus.

Question 8. The following suggestions as to what associations could do to encourage teachers to take membership in them were submitted:

The programme should be made up of interesting papers with discussions (10); the subjects treated should be concrete problems met with in actual works (8), not academic discussions (3), nor yet long-winded papers supposed to be instructive (5); but more heart-to-heart talks in which the teachers are not lectured to but engaged in conversation (3). To encourage attendance the meetings should be held at other times than Thanksgiving and Christmas (2), and the schools should pay the expenses of the teacher, besides giving him the necessary time off (5); or else pay better salaries, so he could afford to go (10).

Interest should be kept up between meetings by printing and distributing bulletins of practical import (15), or by a running discussion by means of circulars like these (17). The transactions should be printed in full (5), and the association should be so administered that the teacher could not afford to miss it (7). All members should be put to work, so that each feels that the association needs him (18); and local centers should be formed for more frequent meetings (6). The general meetings should be held in different parts of the state each year (5), and the offices should be passed around (5). Visits to manufacturing plants (3) and apparatus exhibits (5) add to the interest.

The meetings should be less formal (2) and the social element should be prominent (7). Attendance on meetings should be required by the schools (3) or the teacher asked to resign (2). All should take the teachers' journal and read it thoroughly (6).

To anyone who has read the summaries of these answers, together with those printed in Circular II, it must be very evident that physics teachers are far from agreed as to the aims, methods, and needs of their work. Under these conditions it seems unwise to attempt to frame a detailed outline of a course until we can agree on some general propositions. Since work similar to this has been going on in both Germany and France for some time, it has been suggested that perhaps we can accept first some of the broader principles on which the German and French Associations have agreed as of fundamental importance. The theses proposed below are not literal translations of the German and French ones, but have been rewritten to

meet American conditions as revealed by this discussion. The foreign theses may be found in the article by Young in *Science* for May 18; or more fully in the *Zeitschrift für mathematischen und naturwissenschaftlichen Unterricht*, Vol. XXXV, p. 359; Vol. XXXVI, p. 539; and in the *Conférences du Musée Pédagogique*, 1904. The remarks in parentheses signify the vote of the committees.

1. The subject-matter of the first-year course must be reduced to two-thirds its present amount, or else the time allowed for covering it increased to one and one-half years. (Not necessary, 1; increase the time, 3.)

2. If the subject-matter is reduced, the more abstract, mathematical, and technical topics, i. e., those that have no possible bearing on the student's life, should be first eliminated. The better-established portions of the subject should have precedence over the more recent unproved speculations, on the ground that in the limited time it is better to teach things which are likely to be still believed when the youngster is grown up.

3. In the first-year course the method of presentation is of far greater importance than the choice of subject-matter; i. e., it is better to present a few topics in such a manner that they are powerful examples of the method by which science obtains its results, than to try to teach a large number of more or less scattered facts and theories in such a way that they can only be committed to memory. (In line 2 change "choice" to "amount," 2.)

4. No definition should be introduced until the concepts with which it deals have been clearly developed in the student's mind by means of a discussion of concrete cases from the student's own world. In other words, a definition must be justified before it is stated, not after. (Not wholly, 3.)

5. No law should be stated until the concepts and relations with which it deals have been implanted in the student's mind by a discussion of common experiences and of simple qualitative demonstrational experiments. After the concepts and the idea that there may be a quantitative relation among the factors involved have been grasped, the quantitative relation may be stated and proved either by demonstration or laboratory experiments. In other words, the student must be given an intuitive and qualitative perception of the relations summarized by the law, before he is expected to comprehend and use it intelligently. (Too sweeping, 1.)

6. The student should be made to see clearly that laboratory apparatus furnishes the means of determining quantitatively the relations summarized by laws. He should also be made to see that the apparatus is not the law, that it is not necessary to remember the details of the apparatus in order to appreciate the law, and that the exemplifications of the law are not confined to the apparatus.

7. The student should be made to comprehend that every law has been established by a method of approximation, so that the statement of law is always a statement of what we believe to be true in an ideal case. Hence the measurements by which the law is established give results which approach more and more nearly to the law, the more carefully the measurements are made, and the more completely complicating effects are eliminated. He should also understand that in every practical case the law is not verified because of friction, air resistance, etc.

8. Measurements of the relations involved in practical cases lead to determinations of efficiencies, rather than to the verifications of laws. Such determinations of efficiency furnish for the laboratory work problems which are of great value and interest because of their reality.

9. As few units as possible should be employed, and they should be introduced only when a necessity for their use appears; i. e., their introduction should be justified in advance as in the case of definitions. By this thesis the more abstract units like the dyne and the erg would be ruled out of the elementary work. (Do not omit the dyne and the erg, 5.)

10. Examinations and quizzes should be framed to test the student's comprehesion of and ability to use the more important principles of physics. The questions should not be asked for mere statements of laws from memory; nor should they contain complicated arithmetical puzzles of the sort that never occur in practical work. They should not demand descriptions of laboratory apparatus, nor of unrelated facts which do not have any immediate bearing on the principle involved. They should rather consist of questions as to the arguments by which a principle is established, and as to how the principle is applied in daily life; also of simple problems, which deal with immediate concrete applications of the principle, and which are of the kind likely to be met outside of the class-room or laboratory. (Not the second sentence, 1.)

It is proposed to use these theses, or such others of like nature as the physics teachers may elect, as a preamble to the new syllabus. All who are interested in this work, and who wish to help it along, are invited to send approval, disapproval, criticisms, additions, or other suggestions concerning them to the committees. Such answers must be sent in promptly, as the new syllabus is now being drawn up. They should be in not later than November 15.

This circular is being sent, in consideration of the fact that the summer is not the time to work teachers, to all who have answered either of the others. The new proposed syllabus will be ready for distribution about December 1, and will be sent to all who take enough interest to answer this one or to signify their desire to receive it. All communications concerning this should be sent, as before, to C. R. Mann, Ryerson Laboratory, University of Chicago.

Since sending out the last circular, three associations have added committees to the list as follows:

The Indiana State Science Teachers' Association: Messrs. B. L. Steele, High School, Marion; J. P. Naylor, DePauw University, Greencastle; and W. A. Fiske, High School, Richmond. The Pacific Coast Association: Mr. P. T. Tompkins, Lowell High School, San Francisco. The Eastern Association of Physics Teachers: Messrs. F. M. Gilley, High School, Chelsea, Mass.; J. A. Coolidge, English High School, Cambridge, Mass.; J. W. Hutchins, High School, Malden, Mass. Mr. W. A. Hedrick, Central High School, Washington, D. C., has also been appointed by the physics teachers of Washington, D. C., to represent them in this movement. The membership of Committee of the North Central Association has been increased by the addition of Messrs. G. H. Mead, University of Chicago, Chicago, Ill.; M. V. O'Shea, University of Wisconsin, Madison, Wis.

In order to facilitate the work, the joint committees have voted to organize themselves into a commission. The organization that has been agreed on is as follows:

1. All the subcommittees agree to unite into one large committee to be known as the National Commission on the Teaching of Elementary Physics.
2. Each member of a committee appointed by an association for this work shall be a member of the commission.
3. Each member of the commission shall have one vote.
4. Vacancies in the commission shall be filled by the association in whose committee the vacancy occurs.
5. The committee of each association shall retain its individuality as far as its association is concerned, and shall be free to report to its association as much or as little of the actions of the commission as it sees fit.
6. The commission shall be a permanent organization.
7. The commission shall elect its own chairman every two years.

Mr. C. R. Mann has been elected chairman of this commission for the next two years.

It is hoped that several other associations will appoint committees to assist in this work. The members of these committees will then become members of the commission. At present the commission is composed of forty-eight members, representing twelve associations, as follows:

C. F. Adams, Central High School, Detroit, Mich.; L. E. Akeley, University of South Dakota, Vermillion, S. D.; J. E. Almy, University of Nebraska, Lincoln, Neb.; F. H. Ayres, Central High School, Kansas City, Mo.; E. E. Burns, Medill High School, Chicago, Ill.; H. M. Campbell, High School, Long Branch, N J.; H. N. Chute, High School, Ann Arbor, Mich.; A. D. Cole, Ohio State University, Columbus, Ohio; J. A. Coolidge, English High School, Cambridge, Mass.; John Dewey, Columbia University, New York, N. Y.; W. A. Fiske, High School, Richmond, Ind.; H. M. Garrett, High School, Beatrice, Neb.; F. M. Gilley, High School, Chelsea, Mass.; C. W. Greene, Albion College, Albion, Mich.; K. E. Guthe, State University, Iowa City, Ia.; William Hallock, Columbia University, New York, N. Y.; Paul H. Hanus, Harvard University, Cambridge, Mass.; S. Hayes, High School, Lancaster, Ohio; W. A. Hedrick, Central High School, Washington, D. C.; J. W. Hutchins, High School, Malden, Mass.; J. M. Jameson, Pratt Institute, Brooklyn, N. Y.; F. S. Jones, University of Minnesota, Minneapolis, Minn.; O. C. Kenyon, High School, Syracuse, N. Y.; I. E. Kline, Blair Academy, Blairstown, N. J.; C. R. Mann, University of Chicago, Chicago, Ill.; G. H. Mead, University of Chicago, Chicago, Ill.; E. R. von Nardroff, Erasmus Hall High School, Brooklyn, N. Y.; J. P. Naylor, DePauw University, Greencastle, Ind.; H. Newcomer, Wadleigh High School, New York, N. Y.; A. T. Seymour, High School, Orange, N. J.; M. V. O'Shea, University of Wisconsin, Madison, Wis.; J. S. Shearer, Cornell University, Ithaca, N. Y.; C. H. Smith, Hyde Park High School, Chicago, Ill.; E. F. Smith, Humboldt High School, St. Paul, Minn.; B. L. Steele, High School, Marion, Ind.; O. M. Stewart, University of Missouri, Columbia, Mo.; J. S. Stokes, State Normal School, Kirksville, Mo.; A. J. Stout, High School, Topeka, Kan.; H. L. Terry, State Inspector of Schools, Madison, Wis.; S. L. Thomas, High School, Council Bluffs, Ia.; W. A. Thompson, High School, Webster, S. D.; P. T. Tompkins, Lowell High School, San Francisco, Cal.; W. E. Tower, Englewood High School, Chicago, Ill.; G. H. Trafton, High School, Passaic, N. J.; C. W. Treat, Lawrence University, Appleton, Wis.; C. M. Turton, South Chicago High School, Chicago, Ill.; J. F. Woodhull, Teachers College, New York, N. Y.; H. I. Woods, Washburn College, Topeka, Kan.

# CLASSICAL LITERATURE THROUGH ENGLISH TRANSLATIONS

EDWARD O. SISSON
University of Washington

In the sixteenth century Melanchthon, the father of German humanistic schools, wrote an essay, not devoid of pathos, entitled *De miseriis pedagogorum*, in which among other things he bewails the *stupor pedagogicus* which descends upon the unhappy pupils through their "measureless labor and weariness in learning the Latin tongue." He laments the fate of the German as compared with the Greek who needed not to learn a strange tongue, but, as soon as he could read and write, went straightway to the study of science and philosophy. About a hundred years later, the bright chief of English humanists, Milton himself, complains that "we do amiss to spend seven or eight years in scraping together so much miserable Latin and Greek as might be learned otherwise easily and delightfully in one year." "Language," he further declares, "is but the instrument conveying to us things useful to be known."[1] He agreed then with Melanchthon's opinion, that "Latin and Greek are not culture, but only the gate thereto." Unfortunately, the "easy and delightful" method of learning Latin in one year has never been realized in practice, at least for ordinary mortals.

Since those days the status of culture has greatly changed: the vernacular tongues of Germany, England, and other European countries, which then were despised as incompetent and unfit for the embodying of any true literature or science, have risen to proud eminence in all branches of human thought. Particularly vital to our present theme is the fact that all the greatest classical works, for the sake of which the early humanists endured the "measureless toil of learning Latin," have been rendered by master-hands into the native and current languages of the civilized countries. Yet,

[1] *Tractate on Education*, p. 118. (Cassell, London, 1904.)

strange to say, the evils of which Melanchthon and Milton complain still exist; pupils in our schools still suffer from the ravages of the *stupor pedagogicus*, and still "through long continued chase after words, lose the power to comprehend thoughts." As in Melanchthon's time, so in ours, the study of the Latin and Greek languages, which should be the doorway of admission to classic culture, too often proves instead a gate to bar out. This, we maintain, occurs in three ways. First and chiefest, vast quantities of time are devoured in the endeavor to master the languages, and thus the literatures are almost completely neglected. Secondly, the mastery of the language is, in all but a vanishing minority of cases, so far from perfect that the pupil gets little insight into the author's meaning, less into his style, and none into the true literary charm and beauty. Finally, the *stupor pedagogicus* becomes too often an *odium classicum*—a deep aversion to everything savoring of the languages which have formed such a long and tedious task.

As to the second and third of these indictments, I have little to say; they are old enough, and have been often and vigorously urged, and as vigorously opposed; I can only add a personal testimony which is the outcome of many years of teaching the two classical languages and observing the results of the teaching of others. As to the matter of time I wish to say a few words.

Let us take the case of a lad who studies Latin the usual time in a public secondary school, daily for four years; this makes, roughly, 150 weeks; we may fairly reckon one hour daily for work outside of the recitation. In the natural course of his Latin work he would "take," first, a year's lessons upon matter of no real literary value; then Caesar's *Gallic War* or material of somewhat similar quality and quantity; then from four to six books of the *Æneid*, and six or seven *Orations* of Cicero. Upon these his 150 weeks have been expended.

What might he have done with translations? The following list is given merely as a suggestion of the sort of diet which he might enjoy, without the least idea that it is the best selection possible; let every classical scholar find abundant fault with the selection, and so add strength to my main contention.

| | |
|---|---|
| Plutarch: ten selected *Lives* | 8 weeks |
| Homer: *Odyssey* entire | 8 " |
| *Iliad* entire | 8 " |
| Xenophon: *Anabasis* and selections from the *Hellenica* and *Cyropedia* | 10 " |
| Plato: *Apology* and *Crito* | 5 " |
| Caesar: *Gallic War, Civil War* | 10 " |
| Three or four Greek plays | 6 " |
| Vergil: *Aeneid* entire; selections from *Georgics* and *Bucolics* | 8 " |
| Hesiod: selections from *Works* and *Days* | 5 " |
| Herodotus: selections | 5 " |
| Cicero: select *Orations* and *Letters, De amicitia, De senectute* | 10 " |
| Seneca: *Morals* (selections) | 4 " |
| Tacitus: *Annals, Germanica* (selections) | 5 " |
| Horace, Juvenal, Plautus (selections) | 10 " |
| Marcus Aurelius: selections | 5 " |
| Epictetus: selections | 3 " |
| Thucydides: selections | 5 " |
| Aristotle: *Constitution of Athens*, and selections | 5 " |
| Pliny: selections | 5 " |
| Minor poets and dramatists | 5 " |
| Greek and Roman literary history, art, architecture, mythology, religion, politics, private life, industry and commerce, social systems | 20 " |

The above plan allows amply for the student to read the works named in his hours of private study, and for the teacher to explain and discuss them in the recitation hour, and when necessary to quiz the class upon what they have read. Let it not be forgotten that the time which suffices for this noble survey of actual classical literature is merely the amount commonly given to Latin alone; for those who would take Greek also one-half to two-fifths as much more might be added to the above list, and the time given from the latter part of the secondary course, when the mind is matured and strengthened by the discipline of the earlier years.

By such a plan might the high-school student gain a real and living acquaintance with the master-works of the ancient world—the very thing for which Melanchthon and Milton labored; in weighing the question we must not forget that the great majority of high-school pupils never enter college; indeed, many of them do not

complete the high-school course. When they devote themselves to the study of the Latin language, they simply sacrifice precious years to the acquisition of a tool for a task which they never lay hand to; the tool, poor enough at best, quickly rusts away to nothingness. Moreover, of those who go to college after having spent four years on Latin in the high school, many do not elect Latin, but thank their stars that they are finally done with it; and, alas! some who do take it, upon compulsion perhaps, find other doors to the needed "credit" in Latin than their supposed mastery of the language for which they have paid so dear; in other words, those English renderings of the classics which might have been virtuous companions and entertainers, as well as sources of wisdom and culture, become the student's accomplices in an academic misdemeanor.

I have tried here merely to show reasons for believing that the use of translations of the classics would do far better service to classic culture than the present plan of dragging the pupil through the thorny wilderness of the language. I do not mean to imply the view that the above list, or any similar list from the Greek and Latin literatures, is the most valuable substitute for the years of language study; many other branches of possible high-school study must be listened to. I am not unaware that I am silent regarding what is by some held to be the most cogent argument for the study of Latin and Greek—discipline. This is one point upon which I am quite willing to think with the humanists of the Renaissance, and with the Greeks, who thought it waste labor to repeat childhood in learning a new tongue. There is much suggestion in the words of Plutarch upon his own experience in learning Latin: "It was not so much by the knowledge of words that I came to the understanding of things, as by my experience of things I was enabled to follow the meaning of words."

# SCIENCE IN CIVILIZATION AND SCIENCE IN EDUCATION

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To those of the teaching fraternity who believe that science is not fulfilling her mission as an educative factor in our schools, the ideas that follow are presented for consideration. It is not claimed that they offer a complete solution of the difficult problem before us; yet they may blaze a trail that will be of service to us eventually in finding the lost path, and in leading us to discover the hidden educational treasure.

The first idea to which attention is directed is that of the analogy which seems to exist between the development of the individual and that of the civilization in which he grows up. This concept has proved fruitful in many an educational problem; why should it not help us in our perplexities about science? May we not, from a study of the services which science has rendered to civilization as a whole, form some sort of a general notion as to what she might do for each and every individual? Let us see.

When we seek an answer to the question, "What has science done for humanity?" we find many answers ready for us. Prominent among these is the opinion that science is the cause of our great achievements and of our magnificent progress. We are told that we are better than the ancients, because of the greater control which science has given us over the forces of Nature. Can we not fly across the country at the rate of a mile a minute in what Mr. Dooley appropriately dubs "a rolling home of bliss," and thus spend one day in New York and the next in Chicago? Nay, science has taught us better than this. We can sit comfortably in our steam-heated offices and actually talk to our partners anywhere in the country about our next "business" move. Truly, science has taught us to do in five minutes what it would have taken the ancients weeks to accomplish. Thus science is the cause of this our increased happiness: bravo to science! It was well done.

And in fact, when we come to consider it, the external results of scientific work meet us at every turn. We are dependent every instant of our lives on science for our personal safety. What if our houses were not well constructed? And how do we know that the bridge will support our train? Everything about our dwellings, from the electric lights to the cement floor in the basement, owes its perfection to science. The labors of science have rendered us at one with the world—at least externally—for our newspapers keep us hourly informed of all important transactions that are taking place anywhere on the earth. Yes, truly, we live in a scientific age, since everything about us, excepting our own persons (*mirabile dictu*), bears the thumb marks of science.

Now if science has been and is of such tremendous importance in the life of civilization, and if there is an analogy between civilization and the individual, why does not science play an equally important part in the schooling of the growing man? Look at the requirements for college graduation and you will find that most students become bachelors after having devoted less than one-tenth of their total study time from the kindergarten on to science, including mathematics. How can such as these ever hope to catch up with the civilization about them? And what excuse have the schools for branding as educated such semicivilized beings? Such questions as these must occur to everyone who considers carefully the present educational situation in the light of the relations between the individual and his civilization.

But if we examine in this connection the statistics of the schools, and note how science is avoided when there is free election, we must conclude that the fault lies with the science instruction rather than with the schools. For science seems to glory only in its achievements and results, and this all-too-prevalent idea of the service of science to humanity is—alas!—being used as an ideal for science in education. According to it, every child must be taught to comprehend only the external details of his scientific environment and to know the principles on which steam engines, dynamos, telephones, etc., work. If he does not know at least enough about these scientific surroundings of his to be able to read the daily papers intelligently, science has missed its mark—so they tell us—as an

educative factor in his life. While this is true as far as it goes, is it all? Has science no other mark which has been missed, even though the one just mentioned has been hit?

Perhaps another will appear on further consideration. When science helped civilization to better means of transportation, what was the chief characteristic of the service? Is there any one element which appears prominently in everything that science does? When men first began to trade and to expand their physical and mental horizons, who but science taught them how to cross the seas? And when trade increased and population extended over the greater part of the globe, who but science showed them how to improve their ships so that greater returns were obtained for the same output of energy?

When health is considered, has it not been characteristic of science to show us how to improve methods of life, so that we now understand the requirements of healthy living, both as individuals and as communities? So that again we may recognize it as the function of science to develop better methods and processes and to teach us how to use them.

In the field of agriculture the same thing is true. For here too we note that the scientific study of this subject has gradually developed better methods of farming, so that we obtain larger crops from the same amount of labor; not to mention the reclaiming of tracts of land which were formerly considered as hopelessly barren. These results also have been attained not so much by applying to the problem the results of scientific work, as by attacking it by the methods invariably used by science, and in which her essential power lies.

Hence, when we consider the progress of civilization from the material side only, we must conclude that the service of science consists primarily in furnishing better methods and processes, which lead to the results attained, rather than in merely getting the results. The methods and processes are the causes of the results, and hence they are the more fundamental. So if we would render science more vital and make it a greater power in education on the external, material side only, we must pay heed to the methods of science rather than to its results.

And this means that we must forsake that definition of science which states that it is classified or organized knowledge. For these terms are in the past tense, and they carry with them the idea that the work of science is in the past, and that it is only with the results of that work that we have to deal. These definitions make of science a large museum of classified and organized facts, carefully arranged in glass cases, each of which bears prominently the inscription, "Hands Off." The student is invited to inspect our collection, and to learn the names and order of our well-arranged curios; but he is not as a rule asked to take part in their organization, nor is he even given a chance to find out what the methods and processes of such organization are.

This acceptance of the results of scientific work as constituting science is surely one of our grievous faults. For science is not classified knowledge—a completed thing; but rather classification or organization of knowledge—an active process. Therefore, if we wish to rescue science from its present decadent condition, one of the first steps seems to be the recognition of this distinction. And it is just as easy to present science to students from one standpoint as from the other. We have only to arrange the material so that each fact appears as a step in the process of obtaining a more general result, instead of presenting it as a separate and distinct result by itself. Then science appears as an organizing process rather than as an organized result. From the point of view of the learner, this change is all-important; for he then acquires from his study organizing power instead of memory drill—and it is primarily this organizing power of science which has made it a faithful servant of civilization. Thus science can best serve the individual if it follows a similar course in his case also.

But science has done more for civilization than to furnish it with better methods and processes of utilizing the forces of Nature for the physical comfort of men. It has played, and is even now playing, an even more important part in their intellectual and spiritual life. Perhaps the first point that strikes us when we take up this difficult question is that the worldly achievements of science have little or no bearing on man's intellectual and moral advancement. This idea is so firmly rooted in the minds of some of our best educators

that they go so far as to claim that we of today are intellectually and morally inferior to the Romans of the Augustinian age. It is true, they say, that we have greater physical comfort, but this is but dross: the real life is within, and there we have gone backward. Our scientific attainments have hampered rather than fostered our spiritual growth, for we have come to glory in external achievement rather than in inner excellence.

The fact that such opinions as this, ungrounded though they really are, exist must be placed to the discredit of science as an educative factor. Only those who have studied science far enough to realize wherein her great excellence lies will readily see the reasons for her failure here. But the great majority of people study only the elements of the subject, if they study it at all, and the elements are presented without any regard for the greatest of science's services to humanity, namely, these very intellectual and spiritual ones.

If we would comprehend what science means in the intellectual and spiritual growth of civilization, we must first recognize the fact that science has not been imposed on us from without. It is not a vast system of organized material which stands apart from us to be recognized or not as we may see fit. Science is a product of the human mind, and it has developed gradually with civilization and owes its origin and growth to the insatiable hunger of the human heart for unity—truth some prefer to call it. In its efforts to satisfy this hunger science has been developed—not a body of knowledge organized and mummified—but a power of organization; for, as has been shown, science consists today essentially of such methods and processes as have been found by a long process of trial and improvement to be competent to lead to results that more nearly satisfy our hunger for unity than do those otherwise obtained.

In this process of development of science, a number of intellectual and spiritual traits have been proved to be essential to success. Prominent among these is open-mindedness. No one can be said to have acquired even the elements of the scientific organizing power who has not this characteristic well developed. Yet does elementary instruction in science tend to emphasize this point? Consider the elementary texts of physics, for example. Do any of them allow

the student to think that any interpretation of natural phenomena is possible save that in the book? Are they not all as dogmatic as any religious creed that ever was invented? And yet this glaring violation of one of the most prominent of science's virtues is not in the least necessary, since it is just as easy to show the student that several opinions are possible, but that the one at present accepted by scientists is so because it seems the simplest and most satisfactory in the light of our present knowledge.

Closely allied with this open-mindedness is the recognition of the freedom of the personal judgment. This is one of the most valuable characteristics of science, for without it progress would be slow. And hand-in-hand with this goes tolerance, or respect for others when they exercise their personal judgments freely. Yet in elementary science the poor child is seldom given a chance to use his personal judgment—much less is he trained to use it freely. Small wonder then if even great scientists show streaks of marked intolerance.

Humility and reverence are also characteristic of the true science. And yet science in education not only does not foster these traits, but generally develops their direct opposites, so that we hear much ranting about the greatness of science and of her deeds. Many other noble human qualities which have been developed through science into powerful factors in civilization, but which do not appear even implicitly in the science of the schools, might be mentioned: such as justice, the conception of true freedom as harmony with law, and the ability to see things in perspective, or the relating power. But enough has probably been said to show how science in education has nearly if not entirely ignored them all. In so doing she has failed to do for the individual what she has done for the race. If science were completely to fulfil her mission to the individual, many of our most perplexing political, social, and economic problems would no longer exist.

Such are a few of the reflections that must occur to everyone who surveys science in education from the point of view of science in civilization. And as we ponder them, can we wonder that our youth turn from science without regret? What do we offer them of the many good things we might lay before them? When humanity

has shown itself capable of developing this powerful organizing process for the purpose of satisfying its hunger for unity, how do we science teachers dare to go on feeding to the children nothing but husks? Surely it is because of our ignorance. Yet is it not about time that we waked up to our possibilities? The coveted results lie within the reach of every one of us. We need no new laboratories, no new apparatus, no new equipment for the work. All that we need is a new method of presentation, and this every one of us has within his power to acquire. We have our guide and model in the service of science to civilization; why wait longer to begin?

# AN EXPERIMENT IN TEACHING FIRST-YEAR COMPOSITION

MARGERY GORDON
Central High School, Hamilton, Ohio

Every year I am confronted with a large class in freshman English. The course of study exacts that, for composition work, I give this class what is known in textbook phraseology as "narration with and without plot." Now I cannot begin this by saying to my class, "Write a narrative." I might as well tell them to write a Latin or Greek sonnet. So during the first term I attempt nothing more than a sort of apprenticeship in narrative writing, that is, I endeavor to pick up the loose ends of their previous composition work by exercises in sentence-structure, variety of expression, punctuation, capitalization, paragraphing, and things of similar nature, until I get the class into the habit of writing daily, or two or three times a week, good, well-constructed paragraphs about subjects taken from their everyday life—narratives of their little experiences at home, at play, or at school.

During this time I strive to impress upon them the essentials of good, strong narrative; namely, action and movement with careful selection of details. These I exemplify by reference to their literature, as they are reading at this time *Treasure Island*, *Lady of the Lake*, and similar stirring narratives. By the end of the first term, they have gained a good foundation in the principles of clear, straight-forward narrative without plot, and the beginning of the second term finds them ready to undertake narration with simple plot.

I confess that word "plot" sounds rather appalling for pupils in first-year English, nevertheless they *can* be made to see that if something interferes with the natural course of events in their simple narratives, a complexity of incident will result which *is* a plot. In beginning this subject I usually take some narrative of a simple incident—a buggy-ride, for instance. I ask the pupils to introduce

a "*something*" that will interfere with the course of that ride. Immediately various obstacles are suggested—a piece of paper or an automobile, at which the horse frightens—and before we know it a simple plot is formed in the story of the resulting runaway.

For several years, in dealing with this side of narration, I attempted nothing more than unconnected stories of two or three paragraphs, on subjects which I assigned or the class chose for themselves. Naturally interest occasionally flagged, and in seeking a remedy for this the thought occurred to me, "Why not let them write a connected story in instalments, or chapters, if you please?"

I announced to my class, at the beginning of the second term, that we were going to write a book, "The Adventures of Johnny," Johnny to be a mischievous small boy and the adventures to be taken from various stages of his career. Each composition—one a week we wrote in this term—was to constitute a chapter of the story. I limited the length of these chapters to two pages of theme paper of the regulation size.

The class as a whole was greatly interested in "Johnny" from the start. There were a few dubious, some superior, many apathetic, members, but before we reached the end of the "Johnny"-series, out of a class of over a hundred there were not more than four or five unresponsive. Their delight in creating something—in the thought that they were "authors"—removed the idea of drudgery which the word composition is wont to suggest, and gave them an acute interest in the proceedings. Johnny became to all of us a real, live boy to whom unconsciously the boys and girls attributed their own individual traits and experiences.

In the first of the series, "Johnny's First Battle," I gave them the circumstances of the story introducing Johnny as a boy of four years, who has been given a soldier's suit and equipment with which he goes forth to conquer. The "something" that occasions the plot presents itself in the shape of the turkey gobbler. A battle ensues. Its issue and the consequent story the pupils were to recount according to their own ideas. I was surprised and delighted with the many clever stories that I received. I cannot resist quoting one of the many excellent ones that amazed me by naturalness and ease of expression combined with most artistic presentation.

JOHNNY'S FIRST BATTLE

There was never a happier little boy than Johnny, on his fourth birthday, for Uncle Harry sent him a soldier suit and his papa gave him a gun which would really shoot a rubber ball. The tenth of May, Johnny's birthday, was rainy and cool, so Johnny was made to stay in the house. Before the day was over he had broken two panes of glass and hurt everyone in the house from grandma down to Baby Ruth, with "the horrid gun," as mamma called it.

That evening, Johnny's big brother was reading a book which had on the cover a picture of a soldier. Johnny asked what the man was doing, and when he was told that the man had started out to conquer the world, it set his little mind to thinking. When his mamma tucked him into bed he said, "Mamma, how big is the world?" On being told it was many, many miles around he gave a little sigh—but soon fell asleep.

When Johnny awoke, he asked his mamma to dress him in his soldier suit. After having his breakfast he started out "to conquer the world." He succeeded in subduing the world as far as the barnyard gate, when he met an old turkey gobbler who refused to be subdued. Discovering that he had left the rubber ball at home Johnny hit the turkey with his gun. At this the turkey commenced pecking and flapping his wings in Johnny's face. Johnny fought bravely, but a great turkey gobbler was too much for a four-year-old boy. Mamma heard the screams, ran to the door, and seeing what was happening ran to Johnny's assistance with a broom. Johnny was brought into the house, a very much bruised, but very happy, little boy, for he thought he had conquered at least half the world and could do the rest tomorrow.

For the next chapter or two, "Johnny Runs Away," "Johnny's First Day at School," etc., I gave only the subject with suggestions as to its possible treatment. With these I had equally pleasing results. Finally, when they had entered completely into the spirit of the story, they themselves clamored to choose their own subjects and chose them well. Here is a story whose subject-matter and expression is the pupil's very own.

JOHNNY'S PIGEON-BOXES

At the age of ten Johnny had a great deal of work to do, at least he thought so, and often grew very angry because his plans were destroyed by his being called into the house to do some work. One day Johnny was sent out to watch his small brother, while his mother ran to one of the neighbors. The carpenters had been reshingling the summer kitchen and had left their ladder leaning against the house. Johnny saw a fine opportunity to put in operation a long-cherished plan. After fastening the baby into the chair, he went to the wood-shed after some pigeon-boxes that he had built long before. He mounted the ladder.

for the purpose of putting these boxes on the roof and as he was drawing his knife from his pocket, it slipped from his fingers and landed with a loud "whack" on the head of the baby, who at once set up a howl that brought his mother in double-quick order. Johnny crawled down the ladder a very frightened boy. His fear increased as his mother appeared with a large switch and he was led into the house. What happened in the house is known only to Johnny, his mother, and the switch.

I expected that the chapters of the series would be unconnected, but I was most gratified to find that most of the pupils, after a slight hint from me, linked them together with apparent ease, so that they really formed a unified whole. I do not mean to say that their papers were not sometimes most faulty. Many needed revision and rewriting; some had little or no merit; but the majority of results proved the success of my plan. The pupils *could* and *did* learn free, easy, natural expression, such as can only come from a joy in writing.

Toward the close of the term I asked that all the stories that each pupil had written be tied together and given to me as a book. I said that those who wished might illustrate and beautify their books in any way they wished, and I would certainly credit them, but all I required was the stories neatly tied together with blank pages back and front. I wish I could show you the books that I received. There was none that I was not distinctly proud of. Some were illustrated with original drawings, arranged most artistically, others, by pictures cut from magazines and properly applied. Nearly all the books had colored covers with fancy lettering. Most of them were indexed, an occasional one was dedicated "To My Sister," "To My Brother," "To the Little Girl Next Door." Many were prefaced in a most original way.

In addition to exciting the interests of my pupils by this new treatment of composition, I gave an added stimulus to my own interest. I found that the theme-reading instead of palling upon me—as the reading of a hundred themes a week is ordinarily bound to do—became actually enjoyable. I was intensely interested in the various "Johnnies" which were evolved and anxious to know their successive adventures.

I think I have never felt so thoroughly satisfied with the results obtained from a year's work in composition, and the more so because

the class for that year was in no ways remarkable—rather a little below the average. In spite of this I had achieved tangible results with them—results that I feel sure I never could have gained had I pursued the ordinary method of composition-teaching. I feel confident that this plan can be practically and profitably followed by any English teacher. With the hope that it may prove as helpful to my fellow-teachers as it has to me I submit it to them.

# TEAM GAMES AND CIVIC LOYALTY

LUTHER HALSEY GULICK
New York Public Schools

It was my privilege last summer to have charge of the great Inter-City Public Schools Athletic Meet at the St. Louis World's Fair. Here teams from New York, Boston, Chicago, San Francisco, and so on, representing both high and elementary schools, assembled for athletic competition in track and field sports, relay racing, and basket-ball. While it is true that the development of city life throws an increased interest upon physical exercise consciously developed by means of athletics, still these results, in so far as they relate directly to interschool athletic competitions, are but a small fraction of the total results, because athletics are primarily social and moral in their nature. Only a small fraction of the students of a school can actually engage in an interschool athletic contest, and yet the spirit of athletics, the loyalty to school, the morality shown, and the social conscience developed includes in its grasp all the students of the school fully as much as it does those that actually compete. Required gymnastics of all the students of an institution rest upon hygienic or physiological grounds, while interschool athletics rest upon moral and social grounds. These teams, representing the different cities, rapidly developed the kind of team spirit which makes for individual subordination and the co-operation of the whole group with reference to the attainment of the single end, which is the best performance possible in the sport.

The loyalty of the New York boys, whom I saw the most of, and the magnificent team games of basket-ball played by the two New York teams (one from Flushing High School, and the other from Public School No. 20, Manhattan, situated in the most congested part of the city), were a splendid demonstration of the opportunity that team athletic sports give for the development of that kind of power which is larger than individual power; which subordinates the individual; which produces a conscience larger than the con-

science which recognizes only that individual righteousness; which develops social honesty as distinguished from individual honesty. It must be understood that the boys who went to St. Louis were the representatives of all the boys of the public schools of the city. Over 10,000 boys in our public schools actually entered into competition for places on the team to go to St. Louis, and the moral and social effects of the co-operative endeavor of the St. Louis team were merely the summing-up of similar endeavors extending through a large fraction of the schools of the city. The spirit of fair play, since the introduction of these athletic contests in New York City, and since they have been maintained and carried on with the most rigorous regard for honesty and courtesy, as well as vigor and intensity, has grown greatly.

I take it as a basal fact, with reference to all of the social qualities, as well as the individual qualities, which are manifested in adult life, that they must have their basis in some specific quality of the individual, and particularly some quality in action. It is not sufficient in the cultivation of individual honesty to give maxims, illustrations, or formal instructions. A boy does not have honesty become a part of his character until it has worked out in action, until he does the thing that is honest of his own volition, until this has become a part of his organic nature; so that, in looking for the groundwork, or perhaps better the germs of social morality, social honesty and conscience, we must discover the elements in boy activity which are distinctively "group" in their character, and which may at the same time make for these high virtues.

The largest single group activity of boys is in gangs, and one of the most wholesome forms of gang activity is in team athletic sports. The gang is a beneficent thing. It is a manifestation of group loyalty; but at present in most of our large cities the whole tendency of the gang is evil, because the major part of its activities is and almost must be against the social order.

It is the function of school athletics, when rightly conducted, to convert this gang instinct from evil to righteousness; to make its product social righteousness, rather than social unrighteousness; to convert into terms of actual living, intense interests and activities, the academic discussion which is so often given to them.

Social education is going on with all boys. It is not possible to, nor would we, alter this; but we must see to it that the education is good rather than bad. The gang is the masculine social unit. It is the modern representative of the tribe. It is the germ out of which the club and society develop. It is the chief formative element in determining the character of a very large number of boys, because the public opinion of the gang is for very many the largest and strongest public opinion that there is.

Athletic sports give an opportunity for the direct using of this great social power so as to make for honesty and loyalty. There is no one thing in a school which makes for school loyalty so much as good school athletics. The argument, as already suggested, that only a few boys, and they the ones that need the physical exercises the least, are called into interschool athletics, does not apply, because the major end of athletics is the spirit which is back of all the athletics, and which so larely controls and influences the whole spirit of the institution. By being loyal to his gang, and having the gang clean and moral, or being loyal to his class and his school, the qualities of loyalty, of social morality, and of social conscience are being developed. These are the essential elements out of which social loyalty and morality may be developed.

The one opportunity that schools have to develop feeling and action, with reference to other institutions as such, consists of the athletic relations to other educational institutions. Here is the one opportunity for corporate or social morality. The importance of this altogether transcends the importance of athletics as such. This form of activity is germane to the period of life in which boys and young men are, and depends upon precisely those mental, moral, and social qualities out of which the higher civilization is built. Hence I consider it a matter of supreme importance, inasmuch as I believe that there is something in the world larger than individualism, that there be athletic relations, and that these athletic relations be upon the highest plane of social morality.

# BOOKS OLD AND NEW IN MATHEMATICS

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Inasmuch as the list of recent books for secondary schools published in the June number of the *School Review*[1] contained only one title in mathematics, it may be in order to call the attention of teachers of secondary mathematics to numerous other recent books of importance, and to include therewith also a selected list of older standard books, so as to make up a small working library which may fairly be considered necessary to have within the working radius of the teacher. The following list includes books on algebra, geometry, trigonometry, plane analytics, and elementary calculus as the *minimum* range within which the secondary teacher can afford to be limited. For the most part the high-school texts in common use are not mentioned, and to the list have been added some volumes of general importance and interest on the history and present development and tendencies of the teaching of mathematics.

## I. ALGEBRA

*Introduction to Algebra.* By G. Chrystal. New York: The Macmillan Co.

This and the next following are excellent reference books for teachers of algebra for constant use.

*A Text-Book of Algebra with Exercises.* By G. E. Fisher and I. J. Schwatt. New York: The Macmillan Co., 1898.

*Text-Book of Algebra.* In two parts, I and II. By G. Chrystal. London: Adam & Charles Black, 1889.

These are standard books on algebra, covering both elementary and advanced subjects.

*The Principles of Elementary Algebra.* N. F. Dupuis. New York: The Macmillan Co., 1892.

A suggestive and helpful little volume.

[1] "Books of the Year for the Teachers' Library" is the title of the list in the June number of the *School Review* evidently referred to. Few, perhaps, of the books listed by Professor Slaught could well have been given a place among "books of the year," judging from the dates of their publication, but we gratefully welcome the opportunity of making available to the readers of the *School Review* so valuable a list of mathematical books.—ED.

*A Treatise on Alegebra.* By Charles Smith. New York: The Macmillan Co., 1892.

This and the other texts by this author are standard treatises.

*College Algebra.* By H. B. Fine. Boston: Ginn & Co., 1905.

An excellent presentation of the fundamental principles.

*Graphic Algebra.* By A. W. Phillips and W. Beebe. New York: Henry Holt & Co., 1887.

A geometric interpretation of the theory of equations.

*An Introduction to Graphic Algebra.* By F. E. Nipher. New York: Henry Holt & Co., 1898.

An elementary introduction to graphic work in algebra for the use of high schools.

*Number and Its Algebra.* By Arthur Lefevre. Boston: D. C. Heath & Co., 1896.

An important little volume for every teacher of algebra.

*The Number-System of Algebra.* By H. B. Fine. New York: Leach, Shewell & Sanborn (now published by Benziger Brothers), 1891.

Similar in content to the preceding, but more compact and scientific in form of statement.

*College Algebra.* By L. E. Dickson. New York: John Wiley & Sons, 1902.

*College Algebra.* By J. M. Taylor. Boston: Allyn & Bacon. Revised 1904.

A text using the elementary notions of the calculus in its development.

*College Alegbra.* By G. A. Wentworth. Boston: Ginn & Co. Revised 1898.

*Algebra for Colleges and Schools.* By H. S. Hall and S. R. Knight. Revised and enlarged for the use of American Schools by F. L. Sevenoak. New York: The Macmillan Co., 1896.

*Elementary Treatise on Determinants.* By William G. Peck. New York: A. S. Barnes & Co. (now American Book Co.), 1888.

A good book to supplement the chapters on this subject in the college algebras. But better to read the volume noted next below.

*The Elements of Determinants.* By Paul H. Hanus. Boston: Ginn & Co., 1888.

This is pure algebra, a knowledge of which any teacher of algebra should certainly possess.

*The Theory of Equations.* By S. M. Barton. Boston: D. C. Heath & Co., 1899.

This is also elementary algebra of the utmost importance to the teacher. An admirable introduction to this subject.

## II. Geometry

*Elements of Euclid.* By I. Todhunter. Revised and enlarged by S. L. Loney. New York: The Macmillan Co., 1883.

Lest we forget that geometry was a well-organized science before the dawn of the Christian era.

*Non-Euclidean Geometry*. By H. P. Manning. Boston: Ginn & Co., 1901.

Lest we suppose that the Euclidean is the only logical geometry which the human mind can build.

*The Art of Geometry*. By Arthur L. Baker. Boston: Sibley & Co.

A laboratory manual for the use of students of geometry.

*Famous Problems of Elementary Geometry*. By Felix Klein. Translated by W. W. Beman and D. E. Smith. Boston: Ginn & Co., 1897.

No teacher of geometry should be without a command of the matter contained in this little book.

*An Advanced Course in Geometry*. By Edward Olney. New York: Sheldon & Co. (now American Book Co.), 1879.

A good collection of exercises in geometric invention, including work in solid and spherical geometry and the elements of modern geometry.

*Elementary Solid Geometry and Mensuration*. By H. D. Thompson. New York: The Macmillan Co., 1896.

An excellent book for teachers of geometry.

*Elementary Plane Geometry*. By James McMahon. New York: American Book Co., 1903.

A thoroughly scientific book. Should be in the hands of every teacher of geometry.

*Plane and Solid Geometry*. By George C. Shutts. Chicago: Atkinson, Mentzer & Grover, 1904.

A good exponent of the inductive method.

*The Elements of Geometry*. By Henry W. Keigwin. New York: Henry Holt & Co., 1898.

A book somewhat on the inductive plan.

*Manual of Plane Geometry*. By G. I. Hopkins. Boston: D. C. Heath & Co., 1891.

A book on the heuristic plan, with numerous exercises for advance work.

*Geometry in the Grammar School*. An essay by Paul H. Hanus. Boston: D. C. Heath & Co., 1898.

An important point of view for the high-school teacher of geometry who wishes to be master of the situation.

*Monographs on Famous Geometrical Theorems and Problems*. By William E. Rupert. Boston: D. C. Heath & Co., 1900.

Four parts: I, II, III, IV. These contain much interesting and valuable material, both historical and critical.

*Introductory Modern Geometry*. By W. B. Smith. New York: The Macmillan Co.

An elementary presentation.

*Rational Geometry*. By G. B. Halsted. New York: John Wiley & Sons.

An excellent elementary textbook from the modern view-point. See also numerous articles by the author in the *American Mathematical Monthly* (published at Springfield, Mo.), Vols. I–IX.

*Elementary Geometry, Plane and Solid.* By Thomas F. Holgate. New York: The Macmillan Co.

A book which seems to possess many excellent features.

*Practical, Plane and Solid Geometry.* By Joseph Harrison. New York: The Macmillan Co.

Exceedingly suggestive in the way of practical applications of geometry.

*Experimental and Theoretical Geometry.* By A. T. Warren. Oxford: Clarendon Press.

Valuable in establishing the proper connection between the abstract and the concrete.

*Geometric Exercises in Paper Folding.* By T. S. Row. Translated by W. W. Beman and D. E. Smith. Chicago: The Open Court Publishing Co., 1901.

Most helpful by way of suggestion as to possible lines of interest connected with geometry.

*Science and Art Drawing.* By J. Humphrey Stanton. New York: The Macmillan Co.

Both elementary and advanced work. No teacher of geometry should be without the facility and power given by mastery of at least the elements of such a course.

## III. TRIGONOMETRY

*Plane and Spherical Trigonometry.* By Daniel A. Murray. New York: Longmans, Green & Co., 1899.

A clear and helpful presentation from the standpoint both of the science and of the practical uses of the subject.

*A Treatise on Trigonometry.* By E. A. Bowser. Boston: D. C. Heath & Co., 1892.

Valuable especially in exhibiting trigonometric series and the way in which they are used in computing the values of functions.

*A Drill-Book in Trigonometry.* By G. W. Jones. Ithaca, N. Y., 1896.

As the title indicates, this is a drill-book and fully justifies its title.

*Plane Trigonometry.* By S. L. Loney. New York: The Macmillan Co., 1893. Part I, Solution of Triangles; Part II, Analytic Trigonometry.

A full and scientific treatise, especially useful to the teacher.

*An Elementary Treatise on Plane Trigonometry.* By E. W. Hobson and C. M. Jessop. New York: The Macmillan Co.

This is a good treatment of the computational side of trigonometry.

*A Treatise on Trigonometry.* By E. W. Hobson. New York: The Macmillan Co., 1892.

This is a thoroughly scientific treatise on analytic trigonometry, giving the teacher an idea of the importance of this point of view in contrast to mere goniometry.

*Plane Trigonometry.* By J. M. Taylor. Boston: Ginn & Co., 1906.

One of the best recent working elementary textbooks on this subject.

*A Text-Book of Plane Surveying.* By William G. Raymond. New York: American Book Co., 1896.

An admirable elementary treatise on the applications of trigonometry to plane surveying.

*Workshop Mathematics.* By Frank Castle. Parts I and II. New York: The Macmillan Co.

This and a score of similar volumes recently issued, largely in England, indicate the present effort to attach the study of mathematics to the concrete side of ife. These books usually cover the whole range of elementary mathematics.

## IV. ANALYTIC GEOMETRY

*Analytic Geometry for Beginners.* By T. G. Vyvyan. New York: The Macmillan Co., 1899.

A simple treatment of the point, line, and circle.

*Plane and Solid Analytic Geometry.* By F. H. Bailey and F. S. Woods. New York: Ginn & Co., 1897.

An excellent development of the geometry of the conic sections with well-graded exercises.

*An Elementary Treatise on Conic Sections.* By Charles Smith. New York: The Macmillan Co., 1888.

A thorough analytic presentation of the subject, most stimulating to any mathematical mind.

*Geometrical Conics.* By Charles Smith. New York: The Macmillan Co., 1898.

A thorough geometrical presentation of the subject.

*An Elementary Course in Analytic Geometry.* By J. H. Tanner and Joseph Allen. New York: American Book Co.

Besides the conic sections, numerous higher plane curves are treated in an elementary manner.

*The Elements of Analytic Geometry.* By Percey F. Smith and Arthur S. Gale. New York: Ginn & Co., 1904.

This is especially full and thorough in the discussions and applications over a very wide range of matter. It is an excellent book for teachers to know.

## V. CALCULUS

*Elementary Calculus.* By Percey F. Smith. New York: American Book Co., 1902.

A very simple and brief textbook for the use of students in general science. Its purpose is to introduce students in thirty or forty lessons to many branches of science otherwise closed to them.

*Infinitesimal Calculus.* By Irving Fisher. New York: The Macmillan Co., 1897.

Intended as an introduction to the use of the calculus in modern economic theory, but adapted to the needs of any who wish a short course in the calculus as a matter of general education.

*The Elements of the Differential and Integral Calculus.* By J. W. A. Young and C. E. Linebarger. New York: D. Appleton & Co., 1900.

Especially designed for those who wish an introductory knowledge of the calculus for use in the natural sciences, and for those who wish in a short course to gain a view of analytics and calculus as powerful instruments in modern investigation.

*An Elementary Course in Infinitesimal Calculus.* By Horace Lamb. New York: The Macmillan Co., 1897.

A most suggestive and stimulating text on the calculus and its applications.

*Introduction to the Calculus.* By George A. Gibson. New York: The Macmillan Co., 1903.

An elementary treatise based on graphical methods.

*The Elements of the Differential and Integral Calculus.* By Donald F. Campbell. New York: The Macmillan Co.

A book designed especially for introducing the student to engineering courses.

*Elements of the Differential and Integral Calculus.* By William A. Granville. Boston: Ginn & Co., 1904.

A thoroughly scientific and practical textbook on the calculus.

*Graphical Calculus.* By Arthur H. Baker. New York: Longmans, Green & Co.

A text designed to introduce the student to the use of the graph as an instrument of investigation.

*Calculus for Beginners.* By John Perry. New York: John Lane, 140 Fifth Avenue.

An excellent introduction to physics.

## VI. HISTORICAL AND MISCELLANEOUS

*A Brief History of Mathematics.* By Karl Fink. Translated by W. W. Beman and D. E. Smith. Chicago: The Open Court Publishing Co.

Includes the elementary subjects up to trigonometry.

*Primer of the History of Mathematics.* By W. W. R. Ball. New York: The Macmillan Co., 1895.

A condensed outline of the volume noted next below.

*A Short Account of the History of Mathematics.* By W. W. R. Ball. New York: The Macmillan Co., 1903.

This includes the topics of the subject from the earliest times down through the last century.

*A History of Mathematics.* By Florian Cajori. New York: The Macmillan Co., 1899.

This is a standard work giving a clear exposition of the development.

*On the Study and Difficulties of Mathematics.* By Joseph L. Lagrange. Translated by T. L. McCormack. Chicago: The Open Court Publishing Co.

Very suggestive and helpful.

*The Philosophy of Mathematics.* By Albert T. Bledsoe. Philadelphia: J. B. Lippincott Co.
An exceedingly stimulating book.

*The Common Sense of the Exact Sciences.* By W. K. Clifford. New York: D. Appleton & Co., 1899.
A most desirable presentation and discussion for secondary teachers.

*Mathematical Essays and Recreations.* By Herman Schubert. Chicago: The Open Court Publishing Co.

*England's Neglect of Science.* By John Perry. London: T. Fisher Unwin, 1900.
This little book marks an epoch in the movement for better teaching of mathematics in England.

*Discussion on the Teaching of Mathematics: Meeting of the British Association, 1901.* Edited by John Perry. New York: The Macmillan Co., 1902.
Mighty interesting reading.

*The Teaching of Elementary Mathematics.* By David Eugene Smith. New York: The Macmillan Co.
Invaluable for secondary teachers.

*The Pedagogy of Mathematics.* By J. W. A. Young. New York: Longmans, Green & Co.

Papers on the teaching of secondary mathematics presented at the meetings of numerous associations of mathematics teachers and reported chiefly in *School Science and Mathematics* and in the *School Review.* These journals contain also each month articles, discussions, reports and announcements which embody helpful suggestions to teachers of secondary mathematics, and, at the same time, because of the wider field covered by each journal, the one in science, the other in general secondary lines, they provide a broad and stimulating influence of a general pedagogical character.

# DISCUSSION

## A WORD OF PROTEST

MARY W. DEAN
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Much is being said on the subject of English in the preparatory schools. Ardent demands are made for training which will produce self-reliant, thinking students for our colleges. It was therefore a little perplexing to read a recent article from Wellesley College[1] urging our secondary schools to further research work in English. It would seem that it is time for the teachers of the high schools to remonstrate, or at least to raise a large question. What are we to understand? Shall we try to make pseudo-professors of our fun-loving, quick-witted, restless American youth? Or shall we let the theories spin on, and meet the boy or girl where he stands, and through any initiative possible lead him to find his own thought, and make use of it?

He is to be an able writer; must understand the principles of grammar; must spell, punctuate, and paragraph correctly; must be familiar with some ten books and have an exhaustive knowledge of some five others. This literature study must involve the study of words: derivatives, pronunciations, definitions, and synonyms: the study of references—historical, geographical, and mythological; the study of literary forms; including such subdivisions as the elegy.

Now, from one of our popular colleges the lament goes up that our pupils should learn to annotate their own editions, or at least be taught to verify the annotations that are set before them; otherwise they will never "read with scholarly precision and self-reliance." Is it necessarily studying with self-reliance to know the best sources of information? Might the result not be a thing of shreds and patches? Is not the fundamental process the training of the unifying consciousness that it may sense the relationships of thought? Which process should be emphasized in the high school—the desire and ability to run to books for information, or the information provided, the study of the relations in the seamless robe of the thought-weaving?

We are told they should know the best histories of America, of England, and of the world. How many schools have proper equipment for such study? How many college graduates always know exactly where to look for the desired information? How many agree as to which are the best authorities? Is it because of the annotations provided for them that the pupils are unable to work

[1] "The Practical Side of Preparation in Literature," by Martha Hale Shackford, *School Review*, March, 1906.

independently, or is if because no thought initiative has been awakened in them? Take into consideration the number of pupils that come from towns and small cities, and the varied interests knocking at the door of their consciousness, what are the possible and practical appeals in order to obtain from them the individual impulse? Why shouldn't the colleges teach the mysteries of reference books? Is not the lament strained that the high-school pupil when he enters college is not prepared to annotate his own books? What high-school pupil would appreciate the task of verifying the notes that have been given to him? Much compulsion would be necessary; you would need a rattan over every pupil. On the whole, would this make fine men and women, or lovers of good literature?

Meantime, where are the boys and girls who are fed on this assortment academic? Are they learning to love the art of noble reading? Do they think as they read? Do they take the study into their life-thought, or are they trying to hide behind the tattered academic robes and pretend that their poor, little noddles are full of wisdom? In such a course the really strong pupils will be found on the dissenter's bench.

Truly "of much learning there is no end." A new idea is advanced, a suggestion is made by some college, and the great army of secondary-school teachers follow like foolish sheep the bell-wether of the flock. The real aims of the teaching become confused as the demands become seemingly more and more complex. On the one hand, are the various academic boards passing judgment on the youthful applicants crammed for their approval; and, on the other hand, if the teacher be not yet stereotyped into a tool for these officials, there is a strong, clear appeal of common-sense, and the ready sympathy and interest of the wide-awake American boy or girl.

The sanity of our secondary schools depends on the balance and adjustment which the teacher may make between these conflicting forces. There should be no conflict. The sham and artificiality of pedantic taste should not be applied in secondary schools. Let us spare the children. Let us keep them wholesome, sincere, earnest; not crushed under the accumulated force of our mass of compiled information. If they know the names innumerable of the many who have wrestled with a given thought, what impulse have they to respond with the freshness of a whole mind—a mind untrammeled, unstained, unfettered? Would the colleges not be satisfied if we turn to them boys and girls who perhaps have had narrow experience with books—at least so it would seem to the college professor—but who are nevertheless earnest and full of enthusiasm, doing their individual thinking with a simplicity and self-reliance which ring a note of challenge to the artificial training?

What, then, are to be the aims? Let us face them in simplicity and truth, and question our means. Surely, we should all agree that the candidate should be able to write simple and vigorous English, coherent in thought and not deficient in form. If beyond that he has gained any appreciation of the artistic, feels the satisfying beauty of unity and proportion, he is the better prepared to

value his college course. In the literature work should not the aim be the thorough and thoughtful enjoyment of the work in hand? How many people enjoy reading literature, if they have not only to look up innumerable classical references, but also to memorize the same? It is the exceptional pupil who survives this process and carries with him a sense of the unity and beauty of the whole composition he is studying. So the question arises: Which is the appropriate work for pupils of the high-school age—the study of the literature as a compendium to universal knowledge, or the study of each masterpiece as an illustration of very beautiful constructive principles, thought-relations, and illuminating instances? I have never known a class to fail in active, enthusiastic response to this broad study of the thought-problems. If the work be the drama, the structure of the play, the plot primary and the plot secondary, the relative use of climax, and the binding together of the acts, all of these structural principles appeal to the young student. The interest in characters and their interrelation never wanes; and if they are taught to keep a record of these developments and relations, many a lesson of real truth is involved. It is the same in the study of the oration and the formal essay. If the vital human questions are kept in the foreground, the reality of the work and its first-hand interest make its valuable lessons of law and order and sequence of practical worth to the young writer.

The moment the separation in the English work begins, the pigeon-holing of composition from literature, and again from rhetoric, that moment begins the deadening of impulse. There is absolutely no separation. The leaf is not of interest apart from the parent stock; the whole is vital and resourceful. Pupils know when they are gaining a sense of power; when they begin to feel the possibility of really wanting to write something, and of really writing it in an effective way. There is no stimulus like the stimulus of attainment. The opportunity really to explain one's point of view in class, the assurance that everyone wants to hear and will wait for the full explanation, provides an initiative for thought-investigation. Could the colleges not spare their encyclopedic probing for the sake of getting young men and women alive to the beauty and force of literature, thinking themselves and eager to set forth their thought? I am convinced these results can be attained, if the colleges will stand for them, and help us to shake off the trammels of false processess. The child is not a philologist by nature. He likes the wide horizon and the free lance, and he will strike for the true side. There is no keener or more honest critic than our high-school student, nor one more frank in his maintenance of a cause.

Where is the starting-place for a result like this? To begin anywhere would mean to end anywhere, or, in other words, nowhere or in confusion. The beginning, then, is the all-important problem; for from the true beginning must unfold the full motive power of the language. Would you begin the study of music composition by the analysis of the great symphonies; or the study of practical architecture by diagramming the vast cathedrals of the Middle Ages? Should not the science of language, then, be taught as a continuous development

from its simplest unit of relation, as the youthful composer beginning with his simple melodic form, or the student architect with his simple relation of lines? Here, then, is where the teacher of English should take his stand for the initial work: in the simplest unit of thought-relations—the sentence. Here may be found all the great principles illustrated in the larger forms of composition. Here indeed, in miniature are all the forms of composition. Something said about something, involving unity, coherence, and emphasis, expansion, contraction, proportion, description, exposition, narration, and argument. Little good would it do the child for the teacher to orate on the valuable lessons involved; but so logical, so deductive, so symmetrical, so conceptive, are the grammatical principles that form the basis of our language that the high-school child may be led through skilful questioning, and the abundance and free use of illustrative material, to discover these wonderful formative laws, and to perform the task with joy. He takes no less pride in his language notebook than he does in his laboratory record of his experiments in physical science. It may not always have the completeness of the regulation textbook. It may be, as Touchstone said, "a poor thing, but mine own." This work does not lack in interest, as has so long been charged to the conventional training in grammar. Furthermore, it incites in the pupil the right attitude toward the entire line of work. It is as pure as the study of mathematics and as artistic as the study of drawing. It combines richness and simplicity, and forms the beginning of an appreciation of beauty in literature. If a course is defined by its boundaries, this article may serve as constructive in suggestion, and thus not be subject to the common cavil of futile criticism. I cannot but have hope that out of the confused mass of opinion and dissatisfaction, or out of the grinding compliance, there may rise a teaching that shall be simple, original, and truthful, and not, at least at so early an age, clip the wings of youthful spontaneity.

# EDITORIAL NOTES

*Loan Collections in Geology*

The Michigan College of Mines is engaged in a novel and significant effort to interest the people of the state in its mineral resources and enlarge the field of nature-study in the Michigan schools by means of loan collections of geological specimens sent on application to high schools throughout the state. Each loan collection of specimens is accompanied by a book entitled *Notes on the Rocks and Minerals of Michigan* (Houghton, Mich., 1905), prepared for this express purpose by the Department of Geology of the Michigan College of Mines. This book contains a useful summary of the general characters of minerals and rocks together with an account of the mode of occurrence and distribution of the latter in Michigan, illustrated with a map and charts. It contains descriptions of the minerals of the loan collection, including iron and copper ores and associated minerals; and descriptions of rocks, also represented in the loan collection, including those of the Carboniferous, Devonian, Silurian, Cambrian, and Precambrian periods, the Huronian Rocks and the Basement Complex. The utilitarian as well as the scientific aspects of the minerals and rocks of the collection are frequently pointed out.

One of the conditions of obtaining the use of a loan collection is that "the collection shall be put to active use in the work of the school possessing it. (It may be used in the grades as well as in the high school proper.") It could hardly fail to prove a valuable addition to the scientific equipment of any high school, especially if properly utilized by the teacher of physiography. There can be no doubt of the soundness of the pedagogy which underlies the method of introducing high-school pupils to the study of geology by awakening them to realities both scientific and economic that lie near at hand. In spite of all that has been said in favor of utilizing in education the more immediate surroundings, whether physical, industrial, or social, it is remarkable how little local adaptability schools exhibit. Educationally the example afforded by Michigan College of Mines in stimulating among the high schools of Michigan an intelligent interest in the mineral resources and geological features of the state has a significance not bounded by the specific subject concerned.

*A Conference on Commercial Education*

A considerable portion of "Proceedings of the Conference on Commercial Education," published by the University of Illinois as Part III of the *Installation of Edmund Janes James, Ph.D., LL.D., as President of the University of Illinois* is devoted to papers and discussions on the problem of providing commercial courses and training for business in the high school. Both representative educators and leading business men participated in the conference. The academic and the practical seemed for once to have arranged a truce for parley. Perhaps the most striking feature of the conference was the difference, which became clearly evident, between the two

points of view so well represented. One side, the academic, emphasized the need for useful information and business technique (perhaps because it has been so commonly assumed by educators that useful information and business technique are what business pursuits chiefly demand); the other side, the side of the successful business man, emphasized the need for business technique but still more for moral character and such training as would conduce to its formation.

The address of Professor D. E. Burchell, of the University of Wisconsin, on "How Shall We Teach Business Practice?" and the address of Principal J. S. Sheppard, of the New York High School of Commerce, on "The Essentials of a Commercial Course for High Schools," are representative of the academic point of view. The point of view of the business man is represented in the address by Mr. David R. Forgan, President of the First National Bank of Chicago, on "What Business Men Want Young Men to Know," and the discussion of this address by Mr. E. L. Scott, General Manager of Sears, Roebuck and Company, Chicago.

Professor Burchell's address referred mainly to university conditions. Principal Sheppard's address, however, presented a specific and comprehensive treatment of the subject applying directly to high-school conditions. The address might appropriately have been entitled the "Commercialization of the High School Curriculum." Following a criticism of the "business college" for emphasizing technical facility at the expense of content, Principal Sheppard declared: "It is my conviction that, with the exception of the dead languages, there is scarcely a single standard secondary subject which cannot be very profitably included in a commerical curriculum. But it should be immediately added they must be given the sort of treatment that will yield the most valuable returns for commercial purposes.

"To illustrate: History has come to be a favored subject, the emphasis ordinarily being upon political lines. In a commercial course, the emphasis should be shifted to economic and commerical phases. Indeed, it is my belief that this is the best thing to do in even the classical school. In modern history, for instance, such topics as the following would be given due consideration: Security for labor from state authority; nation, the unit of economic organization; capital assumes large proportions, and enters colonial enterprises; recasting of commercial and industrial practice; mercantile system; rival commercial empires seeking colonies, treasures, shipping; colonial economic policy of Europe; the industrial revolutions; inventions; unstable industrial conditions; factory system; re-adaption and reconstruction of economic life; cosmopolitanism superseding nationalism; study of commercial conditions in Europe at the present time.

"All of this can be made highly interesting to the secondary student, and he can be led through a careful study of English and continental history along these lines—by no means to the entire exclusion of other lines—to a fairly adequate understanding of present-day industrialism and commercialism."

Other familiar high-school subjects, English, modern languages, science, mathematics, drawing, economics, follow suit. They are complemented in

turn to some extent by the educational value of the immediately commercial subjects of bookkeeping, stenography, etc. The latter subjects may be taught so as to have a culture value, just as the former subjects may be taught so as to have a commercial value.

"Briefly stated, it should be the aim of the commercial school to give the requisite technical equipment for business, but also to go far beyond that, and by a wise application of practically all the standard secondary subjects to commercial uses to give a depth and breadth of preparation that will insure an all-round efficiency, an easy adaptability to new and important tasks, and a degree of initiative."

Principal Sheppard's formula for creating a commercial high school seems to be a simple one: Eliminate the "dead languages." (From the fact that he refrains from mentioning them we concluded that he means Greek and Latin.) Reprocess the remaining high-school subjects to make them fit for commercial consumption. Add a suitable proportion of business technique.

Advocates of commercial education are likely to be scandalized by the way in which President Forgan minimizes the essential requirements in business technique. "Specifically, the things a young man ought to know as a result of his educational course are the things which will best help him in his work and lead to his rapid promotion. They are neither numerous nor difficult to learn; but judging from my experience in employing men, they are very rare qualifications in this country.

"What are they?

"First: To know how to write a good legible hand, to make good figures, and to place them correctly—the units below the units, the tens below the tens, and so on.

"Second: to know how to add, subtract, or multiply figures after they have been correctly taken down, and to do it rapidly, and with perfect accuracy; and

"Third: To know how to express yourself clearly, briefly, and grammatically in a letter, and how to spell the words correctly.

"A few years ago I was taking three young fellows of about eighteen years of age into business. They had all graduated from the high school. As a test I gave each of them forty old checks and instructed them to take down the amount of each check; and then add the column to ascertain the total. After they had labored with this gigantic task for half an hour I went over to see how they were doing, and found them all terribly busy and unwilling to submit the result of their labors to my inspection. I gave them more time. Returning later, I found them still anxiously checking and re-checking their work, and I took their examination papers from them. They had all done the job several times, but not one of the three had taken down the figures correctly, and not one of the three had correctly added the figures they had taken down. The task was beyond their powers. They explained to me that they had had no arithmetic for the past five years and were a little "rusty" on it. I remember that word "rusty." It struck me forcibly at the time. They informed me if I would

try them on mythology, they could pass, but I told them I had no use for myths in the banking business. . . . .

"I have not given this subject careful thought or wise investigation, and I may be all wrong, but speaking as a business man of some experience, and as a father of a family, I charge the public schools of this country with attempting to teach so many subjects that the things which I consider essential and fundamental to a business education are not being so thoroughly drilled into the boys as their importance demands. The simple accomplishments which I have mentioned are the essential tools with which business men want boys to be provided when they begin a commercial career."

Another quotation will indicate, however, that President Forgan does not disparage the aim of providing a special type of education for those destined for commercial pursuits. "Only experience, hard, trying, and disappointing experience, can make a business man. But just as the university can put the student through a course of study which, with experience added, will produce an able lawyer or skilful physician, so I believe that it can supply the foundations upon which a successful business career may be built. Such a career will involve industry, faithfulness to duty, the welcoming instead of shirking of responsibility; it will require self-reliance, judgment of men, the capacity of seeing things as they are, and not as they are represented; it will call for courage, faith, and farsightedness; above all, it will demand truth, square dealing, and integrity of character. All that will tend to implant such principles and foster such attributes of character may safely be included in a commercial education."

And again, and finally, the paramount ethical point: "In closing let me say that there is one thing business men want young men to know, which is more important than all else, namely, that integrity of character is, after all, the greatest power in the business world.

"In these days of graft and exaggerated reports of graft, it sometimes seems as if all business were crooked, and all men dishonest. Such a conclusion, however, would be hasty and unwarranted. The revelations of moral obliquity on the part of men in high positions do not prove that the great solid middle classes are dishonest. They only prove that, no matter how rich or influential a thief may be, his sin will surely find him out. The moral sense of the great majority still revolts at dishonesty, and the great mass of business is still transacted on a perfectly straight basis—the basis of simple honesty. Think for a moment of the place and potency of credit in the modern business world. The life-blood of modern commerce is not gold—it is credit. Over 90 per cent. of all business transactions involve credit. Without credit modern business would simply collapse. Credit starts enterprises, builds railroads, manufactures goods, moves merchandise, wages wars, sustains nations, makes civilization. Now if all this be true, if the whole system of modern business is built upon credit, then credit itself must rest upon a firm foundation, or the entire structure would crumble to ruin. That foundation is character. Credit, derived from *credo*, implies faith. Every transaction accomplished by credit is based upon confidence in

the integrity of someone. Thus character is the very foundation of modern business, and ultimate success on any other basis is almost an impossibility.

"A course in commercial education should, therefore, include moral teaching."

THE NEW EDUCATIONAL BILL FOR THE DISTRICT OF COLUMBIA

Last Summer, just before adjournment, Congress passed a comprehensive bill for the schools of the District of Columbia. This action was the result of several years' agitation in the city of Washington, and of several weeks in the taking of testimony and consideration of arguments by committees of the House and Senate. The result may be said to represent the best that the highest legislative body in the land can deliberately produce. Washington has been a sort of national laboratory for experiments in school management, and this, the latest development, naturally demands some attention. For this and the following information we are indebted to Mr. Colyer Meriwether, secretary of the Southern History Association, Washington, D. C.

"There are four important features in it of general interest to public education throughout this country, and one of these of special importance to students of politics and government.

"First, the salaried board that we have had for six years was abolished, and hereafter the nine members constituting the board will serve without compensation, thus returning to conditions that obtained up to half a dozen years ago.

"Second, salaries were increased, and at the same time equalized as much as possible. Here at the very fountain of democracy we can hardly expect either extreme to obtain. For teachers the highest is $2,200 and the lowest $500, these being the two limits for the high school and the kindergartens. They are a very substantial increase from former rates.

"Third, the superintendent is emphatically put in the saddle, being in full control of the whole educational force, subject to indorsement by the board, to whom he must make recommendations in writing. He is to serve for three years at a salary of $5,000, being liable to removal in the meantime for cause. This feature is very significant here, as we have tried both extremes. Up to six years ago, owing to uncertainty in the law, we had substantially one-man power with no very great check. Since then we had a committee of seven, the board of education, trying to discharge executive duties. We now have a blending of both of these systems.

"Fourth, the colored schools are put in the hands of a colored assistant superintendent, under the direction of the white superintendent, but no other supervision by whites. We thus have two distinct systems of schools yoked in the person of the highest white official. Again, this is the choice of the middle way, as for years the negroes managed educational matters for themselves under the composite board of education. Then the white superintendent and several of his assistants had power of management. Elements of both are now welded into one plan.

"The law requires three of the trustees to be women, but has no utterance on the racial proportion, though according to custom here three of the present board are colored. The act makes no distinction whatever between the sexes."

# BOOK REVIEWS

*School Teaching and School Reform.* By SIR OLIVER LODGE, Principal of the University of Birmingham. London: Williams and Norgate, 1905. Pp. viii+171.

This book is really a series of four popular lectures which were delivered before a body composed principally of secondary-school teachers in training. The titles of the chapters are as follows: "Curricula and Methods," "Chiefly on Teaching in History and Science," "Secondary School Reform in General," and "Chiefly on Boarding-School Problems."

These titles reveal little of the wide variety of topics upon which the author has briefly touched. The main bond of unity is not the orderly and systematic development of subject-matter but the spirit of modern pedagogy which permeates the treatment of all subjects. Substance is put before form, and life and function are made to precede technique. The following quotation is fairly illustrative of the general spirit of the book: "I am sure that stimulation of interest in steam engines and stars is the best way of beginning Physics. . . . . I do not care to teach a youth how to measure things which in themselves he cares nothing about. Sometimes the training in a physical laboratory, designed by one who has the instincts of a physicist, is too refined and intricate for the uncultivated taste of the average youth." Yet Mr. Lodge does not minimize the value and the necessity of training in technique.

One of the interesting things about this book is the indirect light which these lectures throw upon the nature of the educational problems with which our English cousins are concerning themselves. Incidentally we learn that both the status and the method of teaching of the classical languages are more of unsettled problems with them than with us. And the problems of the boarding-school come in for a whole lecture's discussion.

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*First Steps in Mental Growth:* A Series of Studies in the Psychology of Infancy. By DAVID R. MAJOR. New York: The Macmillan Co. Pp. xiii+360.

This interesting book of Dr. Major's is based mainly upon records, observations, and experiments upon his own son, and covers only the first three years of child life. Fewer details, especially regarding sensations and motions, are given than are found in the individual studies of Preyer, Shinn, and Moore, while there is less emphasis upon theory than in Baldwin and King, less summarizing of observations of others than in Tracy, and more satisfactory interpretation than in Sully.

The general mode of treatment is to introduce a topic by some general remark as to the nature of the phenomena to be studied and the chief questions to be answered regarding its manifestation in children; then to give the results of the studies of two or three investigators, and follow it by an account of the actions of his own child with interpretations and conclusions.

The topics treated are "Development of Hand and Arm Movements" (covering especially such common activities as using a spoon, throwing a ball); "Drawing;" "Feelings," (of which fear is most fully treated); "Color;" "Number;" "Form;" "Association;" "Memory;" "Imagination;" "Play;" "Pictures;" "Behavior of the Child before His Image;" and "Language," with several appendices giving data regarding sight, hearing, learning to walk, measurements, and the record of three-quarters of an hour's activity of a baby.

The book presents no new theories or generalizations and gives no facts strikingly different from what have been previously observed and reported, but its facts are well selected and its interpretations modest and intelligent. It probably makes for students, more effectually than any other work, a connection between general psychology and child-study.

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*A Four Years' Course in German for Secondary Schools.* By H. K. SCHILLING, W. A. COOPER, L. J. DEMETER, and V. BUEHNER.

This little booklet has been worked out by a committee, appointed by the California Association of Teachers of German, and is intended for the guidance of teachers in the California high schools. It contains advices on reading, grammar, speaking, and composition, and gives a practical outline of the German study in high schools. We recommend it to all high-school teachers of German.

*Der Steinklopfer.* FERDINAND VON SAAR. Edited with an introduction, notes, and vocabulary by C. H. HANDSCHIN and E. C. ROEDDER. New York: Holt & Co., 1906.

It is a beautiful little story picturing episodes from the life of the poorer laboring classes in Austria in the fifties of the nineteenth century. Notes and an extensive vocabulary increase the usefulness of the little book which may prove to be a good reader for second- or third-year German.

*Four German Comedies.* Edited with notes, repetitional exercises, and vocabulary, by E. MANLY and P. S. ALLEN. Boston: Ginn & Co., 1906.

The book contains four one-act comedies of good colloquial German, and full of all sorts of fun. The comedies represent a suitable reading-material for second- and third-year German. Exercises are added which are closely based upon the text.

*Bacon's New German Course.* New York: Maynard, Merril, & Co., 1906.

*The Essentials of German Grammar.* By A. E. DUERR. Boston: Ginn & Co., 1905.

*First-Year German.* By W. C. COLLAR. Boston: Ginn & Co., 1906.

Here we have three new German grammars. There is not exactly any want of German elementary textbooks. Besides the older publications by Whitney, Joyns-Meissner, and Thomas, recent years have produced various smaller and larger German

grammars, for instance Becker's *Elements*, Bierwirth's *Beginning German*, and *Elements of German*, and several others. It should be hoped that at least one or the other of the various grammars will prove a decisive superiority over its competitors, have a chance to experience a number of new editions, and reach finally a high grade of perfection. There are too many of these textbooks in the country at present, and a survival of the fittest would be highly desirable.

The three new grammars seem to be good introductions to the realm of German language, although their methods are very different. *Bacon's New German Course* has an original and practical innovation. It is not divided into the usual lessons. The first part of the book contains a thorough study of the grammar, accompanied by short exercises, which are to be translated into German by the student. The second part consists of German texts for reading and conversation. It is left to the discretion of the teacher how he will arrange and utilize the material offered in the new book and what methods he will follow. The grammatical explanations are clear and the German texts well selected.

The two other German grammars which are mentioned at the head of this review prescribe more closely the method which the teacher has to follow. Duerr's *Essentials* cover the entire field in a very systematic way, beginning with the prepositions and finishing with word-formation. The subject is not divided into lessons, but grammar rules, exercises, and drills follow each other until a chapter of the grammar is covered.

The most systematic one of the three grammars to be reviewed is Collar's *First Year German*. Its first part is made up of sixty well-arranged lessons—each one covering exactly two pages. Various grammatical subjects are introduced to proceed from easy to difficult and to prepare the student as soon as possible for the "Selections for Reading" which form the second part of the volume. The entire book seems to be the product of a thorough pedagogical experience.

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*Studies in English Syntax*. By C. ALPHONSO SMITH. Boston: Ginn & Co., 1906. Pp. 92.

Professor C. Alphonso Smith's little book, *Studies in English Syntax*, will interest and help every thoughtful student of English who reads it. Of the three papers here brought together, the first, "Interpretative Syntax," insists that we should interpret the facts of syntax as well as state them. We should not merely say that the Anglo-Saxon verb *weorthan*, meaning "to become," has been dropped from the language, but should also point out the many idiomatic expressions that have taken its place, such as "to *become* rich," "to *go* crazy," "to *get* tired," "to *run* mad," "to *turn* red," etc. (pp. 20, 21). Professor Smith points out that the old distinction of thought which existed between "you" and "thou" as forms of the singular has not strictly and completely disappeared from the language; the same distinction is now expressed by the presence or absence of such titles as Mr., Mrs., and Miss (pp. 29, 30).

The second paper, "The Short Circuit in English Syntax," does not deal, as one might infer, with the modern tendency to ellipsis; but a large number of facts in our present speech are here brought together and interpreted. For example,

there is a discussion of the so-called group-genitive, seen in such an expression as "the queen of England's throne."

The third paper, "The Position of Words," illuminates many puzzling usages. The explanation here given of the much-discussed expression "It is me" (pp. 77–86) is the only complete and satisfactory one that is known to the present reviewer. The history of the idiom and a sound interpretation of it go hand in hand. The entirely legitimate indebtedness of this third paper to some parts of Jespersen's remarkable book, *Progress in Language*, might well have been more explicitly acknowledged.

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*A Short History of England's and America's Literature.* By EVA MARCH TAPPAN. Boston: Houghton, Mifflin & Co., 1906. Pp. 619.

*A Manual of American Literature.* By JAMES B. SMILEY. New York: American Book Co., 1905. Pp. 321.

*American Poems.* By AUGUSTUS WHITE LONG. New York: American Book Co., 1905. Pp. 368.

*Composition-Rhetoric.* By STRATTON D. BROOKS and MARIETTA HUBBARD. New York: American Book Co., 1905. Pp. 436.

Of the many inconsistencies in the teaching of English in the high school, none is plainer than that which is illustrated by at least two of the books named above. We surely have plenty of authority, from both the college and the school, for spending all the time possible in reading beautiful poetry and noble prose, rather than in studying long lists of short selections, or of summarized biographies. Yet year after year our best publishers keep on giving us such lists, which it is to be feared in some schools still stand between the pupil and the literature he should know. The point can not be made more plainly than it is made in Miss Tappan's book. In a short and convincing preface we are told that the book is based on the conviction that the principal object of studying literature is to learn to enjoy it, "that it is less important to know the list of an author's works than to feel the impulse to read one of them," and "that it is better to know a few authors well than to learn the names of many." Then why should we have a book which attempts to give a history of English literature in two hundred-fifty-five pages, and a history of American literature in three hundred-sixty-four, devoting for example, forty-four pages to the nineteenth century, with names in profusion? Mr. Smiley's book goes somewhat further back in type, consisting of little biographies, each followed by its inch of "estimate," sometimes from a very strangely selected critic, and consequently often unsatisfactory. The *American Poems* is a convenient book to have, either "on the drawing-room table a few days at Christmas," where the author does not wish it to be, or in the school library. It would be useless to discuss the relative space given to different writers; the book contains in general the poems one is apt to wish to find.

The *Composition-Rhetoric* is an interesting illustration of a prevalent tendency to get into print the methods of successful teaching rather than instruction for the pupil. In this book there is much that is good. The emphasis placed upon the uperiority of theme-subjects which draw upon the pupil's own experience and opinion

is commendable, the assignments given are generally good, though not new, and the course indicated should prove interesting. Of the first serious fault we have warning in the preface, which says that "the logical arrangement of material should be subordinated to the needs of the pupils." That may be true, if it can be proved that the pupils will profit most by an illogical arrangement. The summary at the end of the third chapter will show how hard it must be for the pupil to know what he is learning, or what he is learning about, at any particular time. In this chapter are discussed image-making, figures of speech, the use of words, sentence-writing, paragraphing, and theme-outlines, all slightly, and without distinguishing clearly, either subjects or principles. And neither in this chapter nor elsewhere is there an adequate treatment of the paragraph, of the sentence, or of diction. It is true that the amount of technical information given should be small, and that it should be given concretely as good advice about the pupil's writing. But the assumption of the preface that rhetorical theory is taught for the sake of the recitation can not be taken seriously. The simple and obvious laws of the different units of composition are worth knowing, and young people show a preference for definite statements. The fundamental weakness of the book is this: it does not give with clearness or force the definite instruction that boys and girls in the high school desire and need.

JOHN MAXWELL CROWE

UNIVERSITY HIGH SCHOOL

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*The Language Readers.* (Grades I–VI.) Six volumes. By FRANKLIN J. BAKER and GEORGE R. CARPENTER. New York: The Macmillan Co., 1906.

This series of Readers aims to give within the compass of one book for each of the first six years of school all that the children and the teacher need for the study of all the language arts and sciences—literature, language including formal grammar and rhetoric, composition oral and written, spelling, and reading. The authors and compilers suggest two arguments by way of defending the plan: (*a*) "economy of time and money;" (*b*) "efficiency in instruction." Of course it is a canny thought, that of all the material for all these disciplines within one book, and one can readily grant the economy of money; the other items of the two arguments are not to be so lightly assumed, because they are precisely the point and they need further defense.

The selections are made and graded with great taste and judgment, with the exception of a bare half-dozen bits for example, "I remember, I remember," and "Break, break, break," both of which are the purest pathetic fallacies for persons under eleven. With the smallest number of such exceptions, the selections are all things that one desires every child to know—though this is not saying that they are all that one desires his child to know of the literary kind.

The compilers seem quite aware of the danger of fragments; yet there are many bits in the books that, taken out of larger wholes, have the effect of unrelated episodes. Such are the bit out of *Emmy Lou*, all the incidents out of *The Odyssey*, *Robinson Crusoe*, and other longer classics. As a matter of fact every book of selections has the effect of a collection of fragments, and to make such a book the only basis of a child's year in literature is to miss one of the most desirable of literary results—the

impression of a large organized whole. Every such book should merely accompany and supplement some single story or cycle of stories which constitutes the stable basis of the year's literature. This weakness of the series as a complete discipline in literature grows out of the unfortunate theory as to the relation in the child's experience of his reading to his literature, it being obviously impossible to print the whole of any long classic in a child's Reader.

This is not the only weakness of this plan, and all similar plans that have the same fundamental idea. Here are others:

1. To adapt the child's literature for the first three years to his own reading is to keep him at things much too immature, and so to retard his mental and artistic growth. He can apprehend and appreciate many things he can not read. It is the merest commonplace that his speaking and listening vocabulary is years ahead of his reading vocabulary—no matter how he learns to read. Of course this is the secret of the revolt of children who learn to read late—the simplicity of the ideas and expressions are far behind their ability. It is in his literature given through his ear, as literature by nature should be given, that he uses and grows his maturer powers.

2. To entangle literature with the discipline of reading is to put an unfair burden upon a subject that ought to be as nearly pure play as possible. It remains true that with all our experimenting and enthusiasm, to the majority of children, and in the hands of the majority of teachers, the mechanics of reading is drudgery; literature should only share this burden with the other disciplines. Besides, it is surely wise to make upon the children and the teachers the impression that reading is a tool, a medium through which we reach things we want. From this point of view reading books are an evil more or less necessary according to circumstances. But if we must have them they should be so made as to lead the children quickly to the notion that reading is a key to, perhaps a gate through which we get at—the joys and rewards of literature, to be sure—but also the images of history, the facts of nature, the details of handicraft. It should not need saying that every alert teacher is in our day eager to help forward the movement to free literature again from its bondage to the printed page, and that every such teacher laments any tendency to identify the two.

There is a similar objection to the association of drill in writing, in spelling, and in composition with literature—it creates the same impression of a task—a perfidious breaking of the promise of literature. If all or much of a child's composition is attached to his lessons in literature, it inevitably takes finally the form of literary criticism, or of reproduction, ignoring the creative aspect of composition and losing sight of its social or communicating function. Further, it should be pointed out that the literary style and vocabulary are not good for all subjects and purposes, and that the child who gets them fixed upon him is seriously handicapped. On the large scale of things it is a pity to identify "English" with literature, since there is literature in all languages, and since there is much English that is not, and should not be, literature.

One is dismayed and disappointed to come in the prefaces upon the assumption of a theory of composing that one had ventured to hope never to see again—the theory that in all composition the child proceeds "logically from sentence to paragraph and from paragraph to the whole composition." He does this only when he proceeds according to the teacher's "logic." When he proceeds naturally, creatively and genetically, as he should always do in his literary composing, he proceeds in precisely the opposite direction.

Many of the questions and suggestions are not artistically or pedagogically wise. At the risk of seeming captious or ungracious one would call attention to this exercise merely as an example. At the close of the selection from "The Pilot" (*Sixth Year Language Reader*, p. 348) there is this direction: "Notice throughout how the author makes us feel that the ship is almost a thing of life. Quote lines that give you this feeling." We all know that if the sixth grade is told to have a feeling it will get a feeling. Can't we imagine them scampering back to find those lines? Some of them, perhaps the most kindly hypnotic subjects, will find what the teacher hopes they will find; some will be "hot;" some barely "warm;" some straying around the cold edges of the game will find nothing.

The pursuit of synonyms becomes almost irritating, especially when everyone knows that there are many processes of enlarging and clarifying a child's vocabulary more trustworthy as to information, and more creative and literary as to results, than the study of the slippery synonym, if there be such a thing as a synonym. One is appalled to find such information as this (*Sixth Grade Language Reader*, p. 42): "In 'Kathleen' you accent every other syllable." What doctrine of English versification will permit this neat formula to stand? Will the editor who is responsible for that formula try to apply it to the last stanza of "Kathleen"?

Most of the material in these questions and suggestions should never be placed in the hands of the children, but should be given, if at all, in a manual to be used by the teacher.

But really, one turns constantly back to the books with the feeling that he has in them a large collection of charming things, and that if a school for reasons pedagogical or economical adopts the policy of teaching all the language arts and sciences as one discipline (though one must protest that no sound aesthetics will allow any school to sweep literature into this conglomerate), and if the books can be put into the hands of a free and original teacher who would know how to handle and when to ignore the teaching material, these are, because of the high quality of the selections and the wisdom with which they are graded, good books to use.

PORTER LANDER MACCLINTOCK

CHICAGO

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*Principles of Oral English.* By ERASTUS PALMER and L. WALTER SAMMIS. New York: The Macmillan Co., 1906. Pp. xii+222. $0.60.

This book first emphasizes the importance of diaphragmatic breathing, and gives a few simple exercises for gaining control of the voice. The importance of distinct articulation is dwelt upon, and the student is advised to practice until the voluntary act becomes involuntary. Modulation is defined, and the human voice analyzed. Quality is pronounced the basic principle of vocal expression. The relation of the properties of voice to vocal expression is explained in such a way that the student may see how the correct reading of a sentence looks. This should be of particular service to him whose ear is not sufficiently true to enable him to hear with exactness the modulations of his own voice.

It is further explained that emphasis is any means by which the attention of an audience is so concentrated upon a word, a phrase, a clause, a sentence, or an entire speech, that an unusally strong impression is made upon the minds of the hearers. The student is cautioned not to perform an act so that it will merely divide the atten-

tion of the audience between the act and the utterance, since the object of the act is to direct attention to the utterance. By daily, careful, and intelligent practice the student is assured that he can improve, that every conscientious effort is certain to result in material progress.

Those who desire to read in accordance with formulated rules will find an abundance of precepts for their guidance. On p. 62, for example, we find the following: "The complex sentence is delivered with the emphatic sweeps up to and after the words upon which stress is placed, the bend at the pauses of imperfect sense, and the perfect fall at the end." Similarly, rules are given for the reading of all kinds of sentences.

About one hundred and thirty pages of the book consist of excerpts. These divide, for the most part, under two heads: "Difficult Sentences;" "Recitations and Declamations."

A typographical error appears on p. 30, in the speech of Othello. In the ninth line the word "by" should read "thy."

WILLIAM P. GORSUCH

UNIVERSITY OF CHICAGO

# NOTES

## PARTIAL PROGRAMME OF THE CENTRAL ASSOCIATION OF SCIENCE AND MATHEMATICS TEACHERS

The Association meets at the University of Chicago on Friday and Saturday, November 30 and December 1. Two sessions will be held jointly with the American Physical Society, which meets in Chicago on the above dates.

THURSDAY, NOVEMBER 29

8:00 P. M. Meeting of the Executive Committee at City Y. M. C. A. Building, 153 LaSalle Street.

FRIDAY, NOVEMBER 30

10:00 A. M. Meeting of the Association in Mandel Hall, University of Chicago.

Address of Welcome—Acting President Harry Pratt Judson.

Announcements.

General Business.

Address by Professor Lyman C. Newell, Boston University. Subject: "Profit and Loss in Experimental Chemistry."

Address by Professor William M. Davis, Harvard University. Subject: "The Value of Scientific Studies in the Cultivation of Various Mental Faculties."

12:30 P. M. Luncheon. *À la carte* luncheon may be obtained in Hutchinson Commons or at the Quadrangle Club. Ladies may have the advantages of Hutchinson Commons during the meeting. Also the Woman's Union of the University extends its courtesies to ladies in attendance. The privileges of the Reynolds Club are extended to the Association throughout the entire meeting.

1:30 to 5:00 P. M. Section meetings. For a detailed statement of the section programmes see the full programme which will be issued about October 25. In addition to many others on these section programmes are: Professors John E. Cameron (biology), Kansas City High School; Frank Smith (biology), University of Illinois; E. B. Skinner (mathematics), University of Wisconsin; H. L. Coar (mathematics), Marietta, O.; H. E. Cobb (mathematics), Lewis Institute; W. J. Sutherland (earth science), Macomb, Ill.; J. Paul Goode (earth science), University of Chicago; C. E. Peet (earth science), Lewis Institute; W. D. Baker (chemistry), Shortridge High School, Indianapolis; Alexander Smith (chemistry), University of Chicago; Franklin T. Jones (physics), Central High School, Cleveland; C. R. Mann (physics), University of Chicago. On Friday evening and Saturday morning the Physics and Chemistry Sections will meet with the American Physical Society.

5:30 to 6:15 P. M. Informal reception in parlors of the Reynolds Club.

6:15 P. M. Dinner in the Men's Commons for the Members of the Central Association of Science and Mathematics Teachers and of the American Physical Society. The charge for this dinner will be fifty cents per person.


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Not to exceed four hundred can be accomodated. After dinner is served an address will be given on the topic "Science for Culture," by Professor John F. Woodhull, Teachers College, Columbia University.

Following this address the Reynolds Club will be open to all who wish to remain for a social evening.

SATURDAY, DECEMBER 1

8:30 to 10:00 A. M. Business session in Mandel Hall. In addition to the regular business, questions will be discussed relative to our relationship to the magazine, *School Science and Mathematics*, and with reference to the organization of the National Federation of Science and Mathematics Association.

10:00 A. M. to 12:30 P. M. Section meetings.

Saturday afternoon. Excursions for various sections, and meeting of the American Physical Society.

The complete programme will be mailed to all members of the Association. Others who wish to receive the programme should address one of the following:

OTIS W. CALDWELL, President, Room 14, Botany Building, University of Chicago.

C. M. TURTON, Secretary, 440 Kenwood Terrace, Chicago.

C. W. D. PARSONS, Treasurer, 320 Main Street, Evanston, Ill.

C. R. MANN, Chairman of the Local Committee, Ryerson Laboratory, University of Chicago.


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